Maldwyn Centre for Theoretical Physics

Update March 2020

In the same vein as last quarter, these ideas are not necessarily correct, but provide some new directions that deserve future investigation. They involve a re-thinking of how meons and their different types of energies interact.

Colour, strong and electromagnetic interactions.

Current physics considers the colour, strong and electromagnetic forces to be different, although the strong force is acknowledged to be a residual of the colour force and decays exponentially. Thus far, all meon interactions have been based on inverse square force and energy action.

This inverse square relationship has meant that it has been possible to treat the fundamental mass M and Q charge actions identically, and also that the fundamental mass-related s/6 twist energy and fundamental charge-related q/6 charge energy could be treated as (±M±s/6) and (±Q±q/6) respectively.

As recent mathematical work on the dynamics and interactions between meons in one loop with meons in another loop have developed, it has become apparent that it may be the case that the two subsidiary energies (and forces) may have different actions over distance to their fundamental progenitors.

On one level, this is positive, since it simplifies the meon to meon fundamental energy interactions to outcomes of only ±1 in size. On another level, it simplifies the rotational radii of meons in loops, since they can now only be at one radius for the energy of the loop. That this denies the possibility of ever generating the anomalous magnetic moment of, for example, the electron using differential radii for positive versus negative meons and q/6 charges, is not a major issue since the size of the effect of those different radii was always calculated to be too small to be the underlying reason.

So the new possible factors underlying the loop dynamics now being considered are as follows:

1 Fundamental mass M only interacts with fundamental mass. The action decays exponentially with distance. The chase action between opposite sign meons and attraction of same sign meons still operates.

2 Fundamental charge Q only interacts with fundamental charge. The action decays exponentially with distance. Same sign charge energies repel, opposite attract.

3 Twist energy s only interacts with twist energy. The action decays according to inverse-square law with distance. Same sign twist energies attract, opposite repel. Twist energy is only ‘visible’ from one loop to another loop when both centres are within each other’s wavelength (2 π c/w) .

4 Charge energy q only interacts with charge energy. The action decays according to inverse-square law with distance. Same sign charge energies repel, opposite attract.

The outcome of these factors, just considering two loops in the same horizontal plane, is that:

A. The actions of the fundamental energies decay very quickly. They are predominantly MM attractive along the line between the loops since the MM chase sums to zero over a loop's rotation, leaving the MM attraction as the main component. Different sized loops interacting will see variation from this, but not enough to outweigh the overall attraction. There is a vibrational effect perpendicular to the line between the loops. The QQ interactions will sum to zero along the line between the loops, but will have a small vibrational effect perpendicular. The actual size of the energy between the loops is the same when they physically overlap from when the distance between centres is almost zero until just before it is equal to the smaller radius (one loop is centred on the orbit of the meons of the other loop). Approaching the radius, the energy of attraction increases, before reducing exponentially outside that radius.

B. The actions of twist s and charge q are opposite inside the loop wavelength. For every +q/6 that is repelling another +q/6, there is an –s/6 attracting its –s/6. So within the wavelength of the loop, the two energies/forces cancel each other. Outside the loop wavelength, only the charge actions continue. Since other loops can no longer 'see' the twist energies of a loop outside its wavelength, it is like the effect of the loop 'resting' on space time (actually the effect of the background ZMBHs, zerons etc) that is visible to other loops – this is the rotational rate of the loop, which is what we call its mass ($m_e c^2$).

The graphs and spreadsheet containing these insights will be uploaded onto the MCTP website in due course. Some are included here to show the main effects.

The calculations assume a subject loop of fixed circular shape at a fixed point in space with meons fixed at appropriate radii from the centre and the six meons rotating at the appropriate frequency Each meon's force acting against each meon in the object loop is calculated at the pair's specific distance in terms of X and Y coordinates and the sum of all X and Y forces taken as the total force on the subject loop acting at its centre. The MM, QQ, ss and qq forces are calculated separately then added into M+s and Q+q in X and Y planes to provide four graphs. The sum total over all forces is then shown in a fifth graph.

The distance graphs are snapshots of the totals taken at different distances to show the shape of the forces curve from close in to far out.

The spreadsheet from which the graphs are taken does not provide absolutely precise numbers for the forces between meons because in every 360 degrees of rotation of the subject loop, there is always one line which represents the change of distance between two meons. At that point, the chasing force changes from repulsive to attractive, or vice versa. So this point should be a zero for force but is counted as a change from +1 to -1 or the reverse and will thus be at least the fraction ±1/360 wrong.

Also when treating the proton and neutron, the assumption is that each is a single loop of proton size rather than a stack of seven or nine loops. This underestimates the forces between the stacks because there will be many cross-stack meon-meon interactions not included in the total. The use of single loops of one-seventh or one-ninth proton size gives a better estimate of that fraction of the total force between correct-sized loops, but also misses the cross-stack factors.

The direction of relative rotation is controlled by a factor of ±100%, which may or may not adequately represent the actual situation and no different-sized loops were considered. Additionally, in order to provide an MM and QQ force of approximately correct size for colour/strong forces at the right

distance, the factor k has been used as k= $2x10^{-13}$ in the exponent for force at a distance between meons. More research on why k takes that value is required. All loop interactions start with an offset of the object loop by 30 degrees to ensure that no meons start directly on top of each other.

The overall result is that the calculations should be viewed only as a start. The general shape of the forces over distance and at a distance should be considered as indicative but not exact.

The upshot of these calculations is that once two loops, in a horizontal plane, have largely overlapped, the force keeping them like that is very large. The result is a stack of loops. However, it still matters what the identity of the respective loops is. Although the force attracting the loops into a stack is the same for any two loops, only those loops that provide stability of balance over the whole stack will remain stable. So quark imbalances in q/6 charge positions will require other quarks to balance out those imbalances. The symmetry loops, including neutrinos, are balanced and can exist in nucleon stacks.

No consideration has yet been made on how interactions between loops at other than those in the same plane have been undertaken. This will be made in the next quarter, if possible.

In the attached graphs, the notations mean:

Title	Subject loop, object loop. DDA = distance between loop centres in DAPU Planck units
Offset	Always 30 degrees
Rotation	Same or opposite
id	Influence distance, beyond which s energies do not interact
k	Exponential factor, always $2x10^{-13}$
w	w1 is subject loop angular frequency, w2 is object loop angular frequency

For the strength of forces graphs:

E	Force between meons, exponential based M or Q combined with inverse square s or q
EY STR Ms	Strength along direction between meon centres for M and s forces
EX STR Ms	Strength perpendicular to direction between meon centres for M and s forces
EY STR Qq	Strength along direction between meon centres for Q and q forces
EX STR Qq	Strength perpendicular to direction between meon centres for Q and q forces
EY M+Q Tot	Total strength along direction between meon centres for M and s and Q and q forces

Note that positive values for M and s are attractive, whilst negative values for Q and q are attractive.

It is interesting to compare some interactions between different loop types.

e- e- has the same values as e- v in each graph within 10^{13} PU. At 10^{14} PU a difference between the two appears, with e- e- having Ms attraction versus Qq repulsion whereas e- v has small values for each of these forces.

e+ e- is the same as e- e- under 10^{13} PU. Beyond this distance the Qq effect is opposite for each.

p+ p+ and p+n0 are the same out to 10^{13} PU. Beyond this distance the p+ n0 X frequency of change of force direction is double that of the p+ p+ and the Y forces of the p+ n0 are much smaller than those for the p+ p+.

u+ d- loops have the same form as p+ p-, although at different distances.

Opposite rotation only affects where the maximum and minimum values are in X forces.

For the distance graphs:

Title Describes the values for M,Q and s, q and the distances considered in the graphs.

Then uses the same definitions as above.

There is always a bump up in attractive force when the loops overlap at centres equal to their radius. Inside this distance the force is the same. Outside this distance it falls rapidly.

Far outside the loop size (basically beyond the wavelength of the loop), the only forces in action are q charges, taking the expected values and directions related to the loop charges.

Looking at nucleon stacks – and considering them as seven or nine loops, it is interesting to see that there is a form of force graph that resembles what is observed for the strong force, although over a wider radius range and without the sudden repulsion inside 1 $x10^{-15}$m. The latter may be, in the same way that the twist energy has a range associated with the loop wavelength, an artefact of the loop size – but this is not within the direct dynamics of the meon interactions.

Some other points

Inflation

Inflation is assumed to be the product of collision interaction between meons of the same type in different loops once chains have formed loops after the initial unmerger event. The collisions set off loop expansion because the direct head-on collisions across two loops decrease the speed of each and thus require the increase in size of the loops to maintain angular momentum within the loops and meons.

Having suggested that the three fermion families are due to different inflation amounts along the three dimensional axes, it is worth showing the maximum amount of inflation and the maximum time taken to inflate. These maximums relate directly to the size of the smallest mass, largest radius, loop – the electron.

The amount of inflation is the difference between the size of the electron loop at formation in a big bang event and its final size. The time taken to inflate is simply the distance travelled by each meon from initial size across the diameter of the loop to its final size at the speed of light.

Note that nothing during inflation exceeds light speed, and due to background viscosity, the speed across the diameter may average considerably lower than light speed because the loop size increases as the speed decreases in order to maintain angular momentum within the loop.

The initial loop size is hypothesized to be formed at the Planck energy, although physical interference between similar type meons actually precludes this. However, the difference is small and can be ignored. The final loop size for the electron is what we call the rest mass of the electron.

The assumption used is that the initial loop velocity at the Planck energy is very close to light speed and the final speed corresponds to that of the meons in the electron loop. This latter speed is so low that it can be treated as zero, resulting in the average speed across the diameter is half light speed.

Using both SI and DAPU units, the calculations for an electron are:

Change in size

	SI(units)	DAPU(respective units)
Start	$4.05\ 10^{-35}$m	1
End	$7.01\ x10^{-24}$m	1.73×10^{11}
Inflation factor	$1.73\ x10^{11}$	1.73×10^{11}
Diameter	$1.402\ x10^{-24}$m	$3.46\ x10^{11}$
Speed	½ c	½ c
Time taken	$9.34\ x10^{-32}$s	$2.4\ x10^{-34}$

The energy released by inflation is the sum of all the energies released by all the loops between their initial energies, assumed to all beat the Planck energy) and their final sizes. These loops include both normal and dark matter loops and so their numbers cannot be estimated easily, so just the energy released by a single electron will be calculated here.

Initial energy	$M_* c^2$
Final energy	$M_e\ c^2$
Energy released	$M_* c^2 - M_e\ c^2$

It is interesting to note that the success or failure of any big bang depends on the size of the largest radius, smallest mass, loop formed during inflation. So the electron, in our inflation, directly decides the fate of our big bang and all subsequent interaction energies for atoms etc.

In the above the rest mass of the electron has been assumed to be the same in all environments, but it may be that the rest mass is actually dependent on the density of the local environment.

Big Bangs

It is likely that our big bang was, at one level, nothing out of the ordinary. Not a special event amongst many random and continuous big bangs throughout the universe. What was different in our case was the large amount of loop inflation that occurred, enabling the subsequent expansion away from the centre of the big bang by the large radius, small mass, loops created.

The failed big bangs may be a source of high energy photons (gamma ray bursts) since the masses of the loops formed will be large and energetic, so photons created and emitted will be of very high energies.

Dark Energy

The core issue with dark energy is the luminosity versus red-shift observations. If the red-shifts observed were actually made from three components rather than two, it may help understanding.

The hypothesis may be termed 'tired light', but it is not the sort that produces absorption line frequency broadening that is usually invoked.

The hypothesis is that photons are composed of a fermion loop an anti-loop rotating in the same sense. The radius of the loop defines its frequency and the spiral path travelled by each of the particles and anti-particles that comprise each loop is exactly the same as the overall path of the photon, except at extremely high energies. So almost every frequency of photon experiences the same viscosity, when moving against the background over its path, which thus requires the same amount of energy to be taken from its frequency. There is thus no broadening of absorption lines, and 'viscosity red-shift' is the third component of observed red-shift which is not currently considered.

The result of such a viscosity red-shift is that this component is directly proportional to the distance from observer to the photon emission point. Deducting the viscosity red-shift from each observation will produce a lower expansion rate for the universe, or even suggest a stationary non-expanding universe if the viscosity red-shift component is large enough. This may be enough to suggest that dark energy is a figment of ignoring a component of observed red-shift.

Here is a bit more detail underlying the hypothesis.

1 The universe is older than our big bang and relics of previous failed big bangs are dotted randomly throughout it, forming black holes around which our big bang expansion could coalesce – acting as scaffolding for galaxies etc.

2 There is only one type of particle and anti-particle existing and every object is made from these. When partially merged, many such pairs form the background that is the universe and through which all relativistic motion occurs. When such a pair is unmerged, the two chase each other, catching onto other such pairs to form chains The chains eventually catch onto their own tails to form loops.

3 Loops of three pairs are our threefold symmetry normal matter and are our fermions. Loops of other than three pairs are dark matter. The ratio of three pair loops to non-three pair loops is a measure of normal matter to dark matter.

4 Loops combine by stacking to form bosons and nucleons. It is the threefold asymmetry of the quark loops that means they need their asymmetry to be balanced in a stack, where loops in the stack have alternating rotation orientation, so as to be stable. This asymmetry is what is normally called 'colour'.

5 Atoms can only be formed when a loop stack and its symmetric largest-charged loop both have the same total spin, usually given as ½ h. That is why four-pair loops cannot form atoms and only the next odd number of five-pairs can do so.

6 Because being balanced in a stack requires similar asymmetry for loops, then non-three-pair loops cannot exist in a threefold stack or interact stably with three-pair loops other than via their loop size – which is what we call gravity. So non-three-pair matter is not observable at distance except by its gravitational action and the even-pair matter loops do not form atoms at all.

7 Photons, which are loop and anti-loop rotating in the same sense, have each of the three pairs in one loop almost completely merged with the three anti-pairs in the other loop. The newly created pairs across the loops chase each other to maximum velocity. The maximum velocity is set by the density of the local background and is a terminal velocity that we call light speed.

8 The density of the background provides a viscosity which requires energy to match and this energy is lost by the photon as a reduction in rotational rate – a frequency reduction or viscosity redshift.

9 The six almost completely merged pairs of the photon are what is affected by the background viscosity and so, almost regardless of the frequency of the photon, the viscosity red-shift is directly proportional to the distance travelled by the photon.

10 Viscosity red-shift has not been considered in relation to observed red-shifts yet. The result is that the distance to observed objects may be considerably less than currently calculated. So the rate of expansion of our big bang may be lower than estimated, or it could be that there is no expansion or even possibly a contraction.

11 If the viscosity red-shift means that distant objects are actually closer than we currently calculate, then the high rotational velocities seen in galaxies may be substantially lower and the effect of dark matter also lowered.

12 There are only two forces in nature, due to mass and charge. The fundamental particle and anti-particle have adjusted-Planck sizes of mass and charge, of equal value. The unmerger of a merged pair results in each of the pair always spinning at a rate which generates one-sixth the electron charge on each, positive on one and negative on the other. In a three-pair loop this means only fermion size total charges.

13 Since the fundamental particle/anti-particle are adjusted-Planck mass and radius, they are the most dense particles possible and no galaxy-sized black holes can break them, so there can be no singularities. And since there are only the fundamental particles and anti-particles in existence, either merged as the background or unmerged in loops there can be only one universe and the metric expansion of space cannot occur.

14 The unmerger of a pair of particle/anti-particle that form the background to the universe always results in one of the pair generating positive one-sixth the electron charge and the other generating negative one-sixth electron charge. So the balance of electron charge in the universe is always zero – the loops with three pairs will have charge values of only positive or negative 1, 2/3 1/3 or zero electron charge. These three-pair loops are our fermions.

15 The energy released in a big bang is the difference in loop frequency between the initial chain formation stage and the final inflation that occurs. Once many loops have been formed at very high energy (high frequency rotation around the loops means very small radius of rotation) it takes only collisions between loops, and conservation of angular momentum of the particles/anti-particles within

loops, to force them to inflate to very large radii (very small energy). Inflation along the three dimensions of space leads to three families of fermion sizes becoming locked in. There will be some amount of inflation, and thus a loop size, in the equivalent of an electron, at which a big bang only just succeeds.

16 The collisions between loops can be described as a big bang setting off an inflation event. The question is whether the inflation is sufficient to overcome subsequent gravitational collapse. If the inflation is small, then the loops will not enlarge much and their rotational frequencies, which are effectively their masses, will be large. The energy released by inflation from near Planck size at the start of the big bang to the large loop masses will not be sufficient to overcome the gravitational collapse of the loops back onto the point where inflation started. This is a failed big bang.

17 A failed big bag will not result in the particle/anti-particle pairs within the loops remerging. Instead the result will be a chain star where the loops are broken by the steep gravitational field as they elongate on entry. This might be described as a primordial black hole. However, it is really a chain star because within it all the loops are continually breaking and reforming . The pairs in the chains can only escape from the star if they are part of two symmetric loops which stack, as loop and anti-loop, to form a very high energy photon whose escape is perpendicular to the surface of the chain star. In doing so, the photon loses most of its energy.

18 There are two very important points here. Firstly that no black hole of any size can tear apart any of the fundamental particles or anti-particles, so there are no singularities. Secondly, these failed big bangs are dotted randomly throughout our only universe and our successful big bang is expanding past them. They act as concentration points about which gas and galaxies from our big bang can condense.

19 Our big bang was successful only because its inflation was sufficient to expand the loops a great deal. The energy released by the inflation of the high energy (small radius) loops to small mass (large radius) loops was large enough that the small mass loops could continue to move away from the centre of the big bang overcoming gravitational collapse.

20 To calculate the energy released in our big bang requires firstly assuming that the starting frequency of loop formation was the Planck energy and that the frequencies associated with our fermions are the final energies. And also assuming secondly that photons started at the Planck energy and what we observe now is their final energy at our position. Thirdly requires the assumption of the numbers of each type of matter loop and similarly for dark matter loops.

21 Because there is only one type of particle in existence – of adjusted-Planck mass, charge and radius size – there can be no other universes. Everything we observe is made from these single-sized particle/antiparticle pairs. And there is only one form of composite made from particles/anti-particles – the loop. And the loop is the physical manifestation of both space (in the volume it occupies as it rotates) and time (in its frequency of rotation).

From a background with only one type of particle/anti-particle and only one composite loop form we can construct everything that we observe –the background merged pairs form a continuum in their huge and overlapping volumes which affect the particulate unmerged fundamental particle/anti-particles in their motions as loops that in turn affect the background by forming centres to coalesce around.

Such a simple foundation can explain so much. Dark energy is not mentioned directly because in this hypothesis it does not exist – it is a factor that drives a need for something to explain a mismatch caused by not-including the effect of viscosity red-shift within the total observed red-shift.

Cosmology

There are a few issues in cosmology that cannot be explained in the currently accepted interpretation of the big bang, inflation and expansion, but can in the hypothesis that observed red-shifts are not only due to motion, but also include a component due to viscosity red-shift.

If viscosity red-shift were to represent 50% of current long range re-shifts, then the following issues would no longer be problematic:

1 Our galaxy is supposedly leaking away hypervelocity stars. If the distance to these stars were significantly less, by the 50% example, then their apparent velocity would be reduced by 50%. It is unlikely that at this relatively short range that the factor would actually be 50%, but possibly the factor would be enough to reduce the apparent velocity to a lower figure. As the distance to objects increases, and their observable red-shifts increase, then the viscosity red-shift factor will increase towards 100%, plus or minus their actual relative velocity.

2 Supernovae may not be the only source of high energy explosions that look like supernovae. The chain to loop formation followed by inflation, which is a big bang, probably happens somewhere all the time. Mostly these big bangs fail and the result will be chain stars – currently called black holes. It is the photons released during and after such an inflation event that could look like a supernovae explosion. The photons formed will be made of many numbers of pairs in loops, but are indistinguishable from our normal matter type photons. Where in the universe it is unusually suitable for big bang events, they may be repeated over time in close proximity to earlier failed ig bangs.

3 The star which seems to be older than the universe, HD 140283, may just be older than our own big bang. It may represent one of the earlier failed big bangs. However, it may have been big enough of a failure not to have collapsed into a black hole, but formed a star of sufficient size to generate some metals.

4 The biggest star in the galaxy may still be the biggest, but its actual size would be reduced if its distance from us were reduced by the 50% in our example of viscosity red-shift factor.

Mike Lawrence

Maldwyn Centre for Theoretical Physics

Imagining the unimaginable

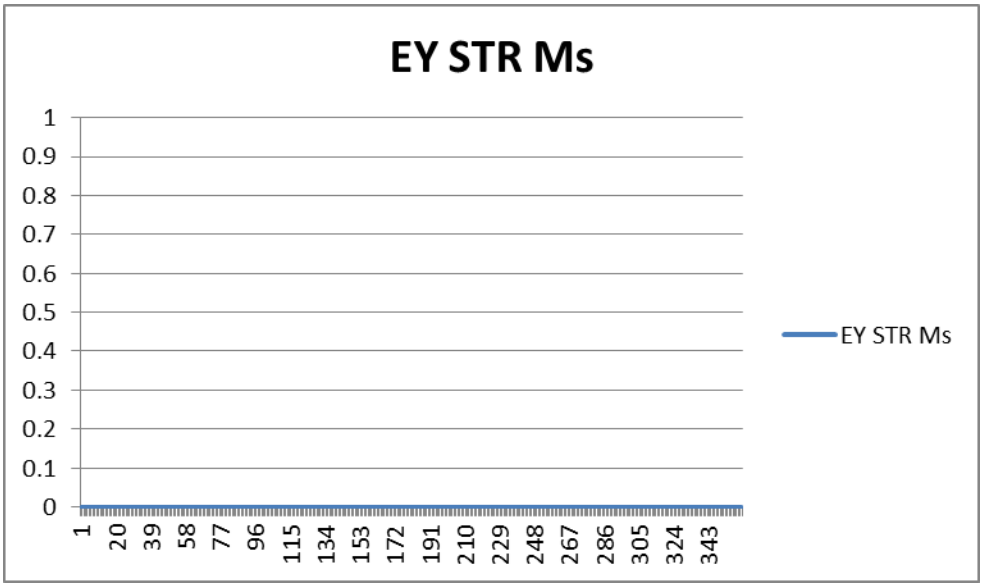
Solving the insolvable

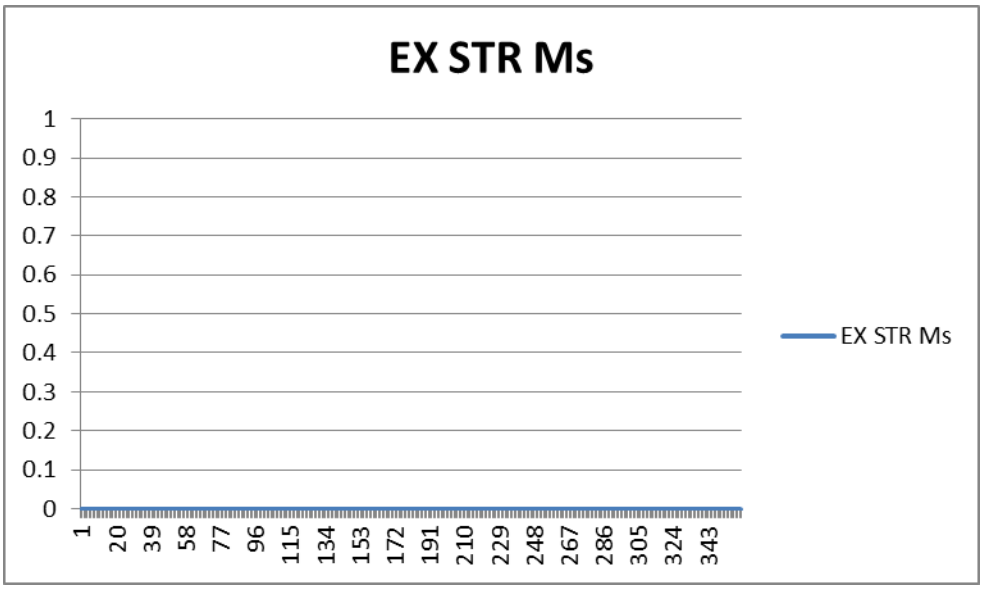
27 February 2020

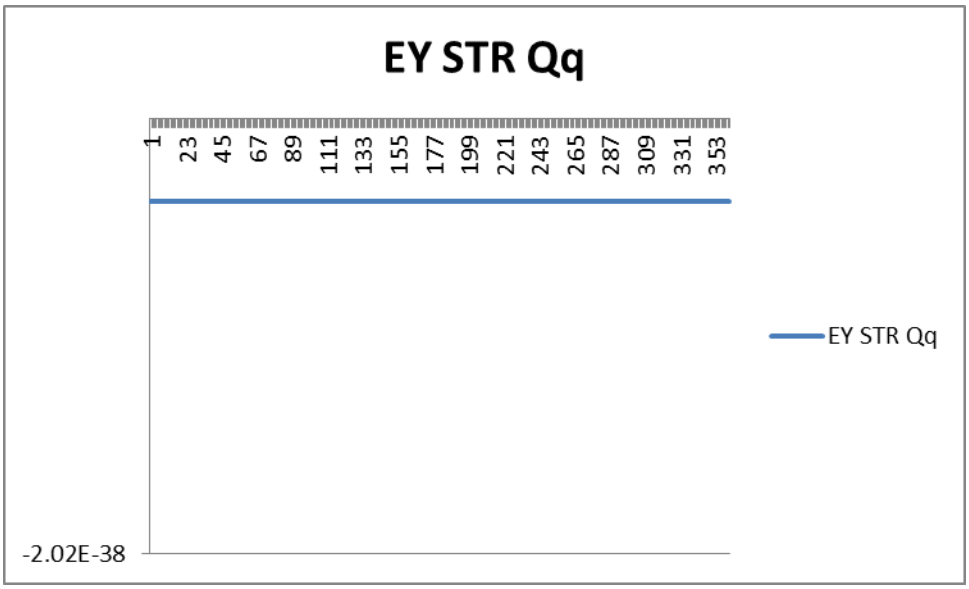
same

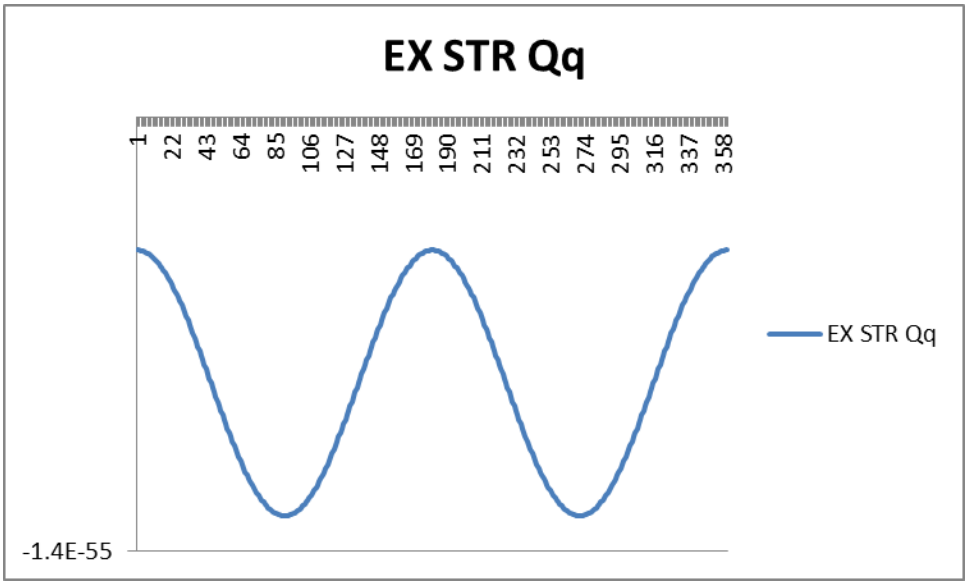
e-e+- DDA 2.4 10^17 rot id=10^16

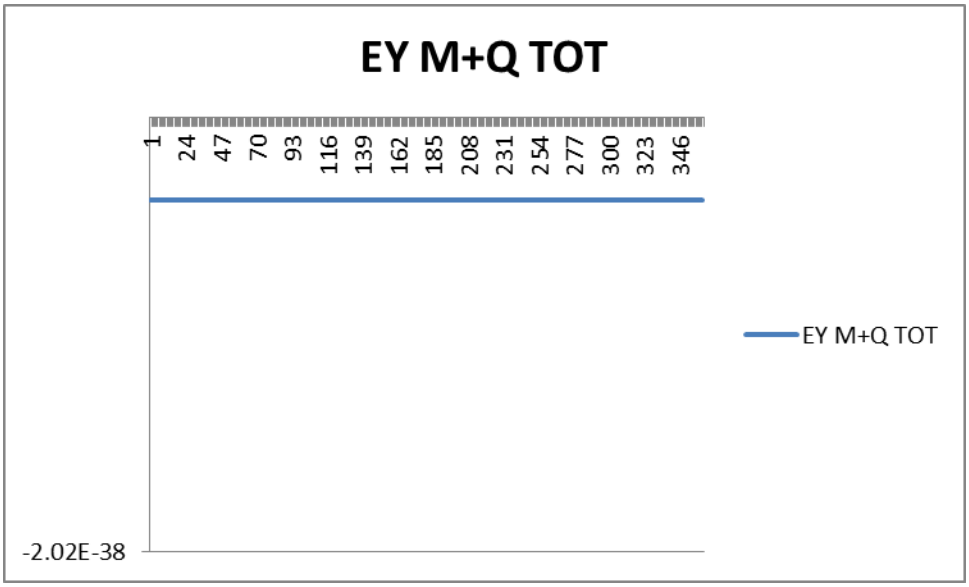
offset 30o w1=w2 k=2x10^-13



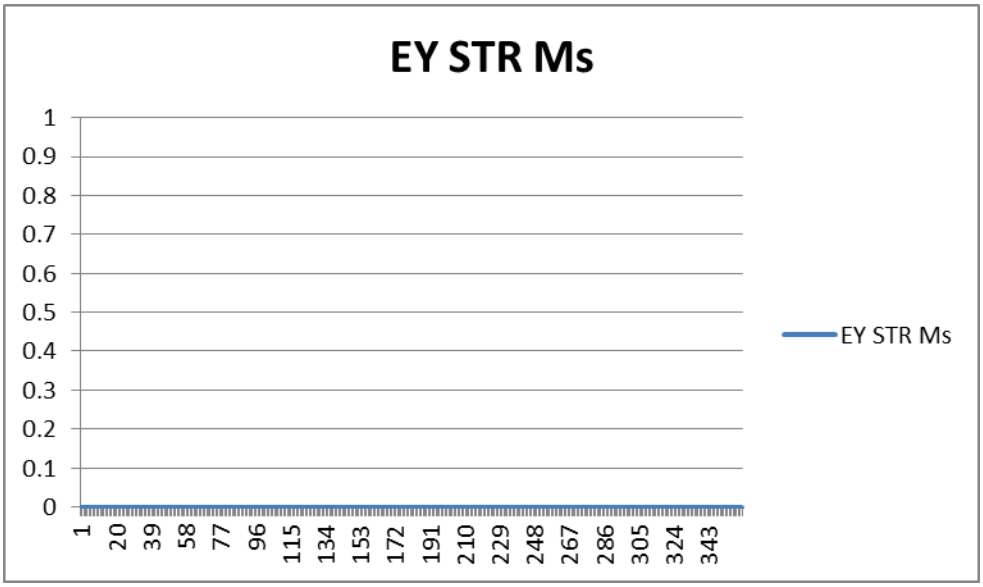


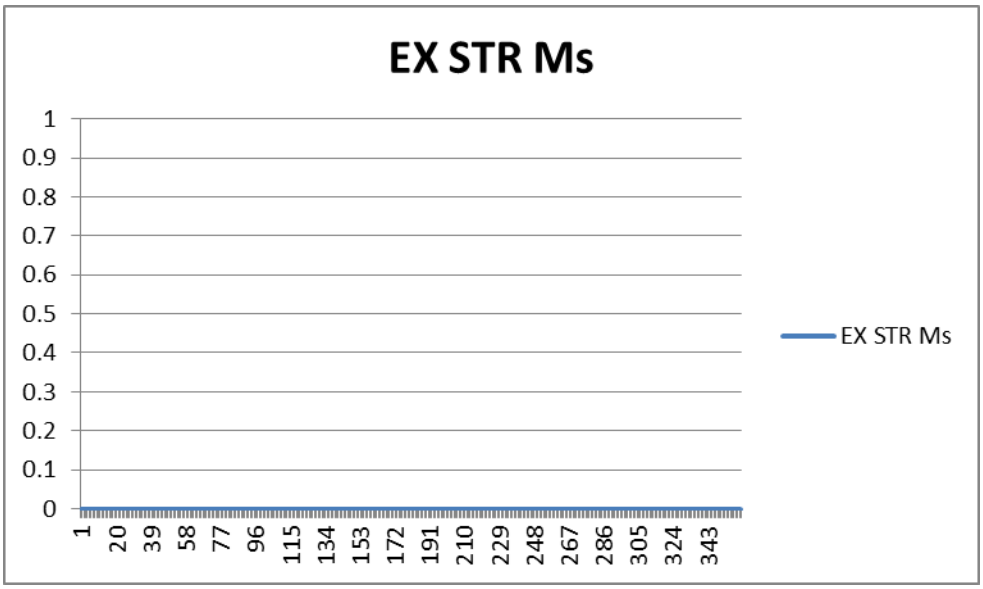


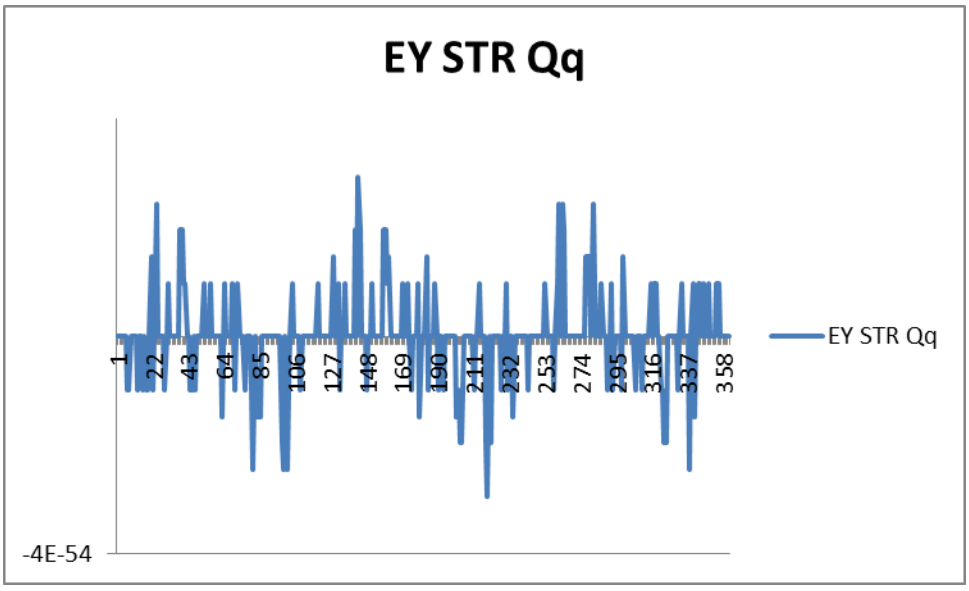

EX STR Qq
1
22
43
64
85
106
127
148
169
190
211
232
253
274
295
316
337
358
-1.4E-55
EX STR Qq

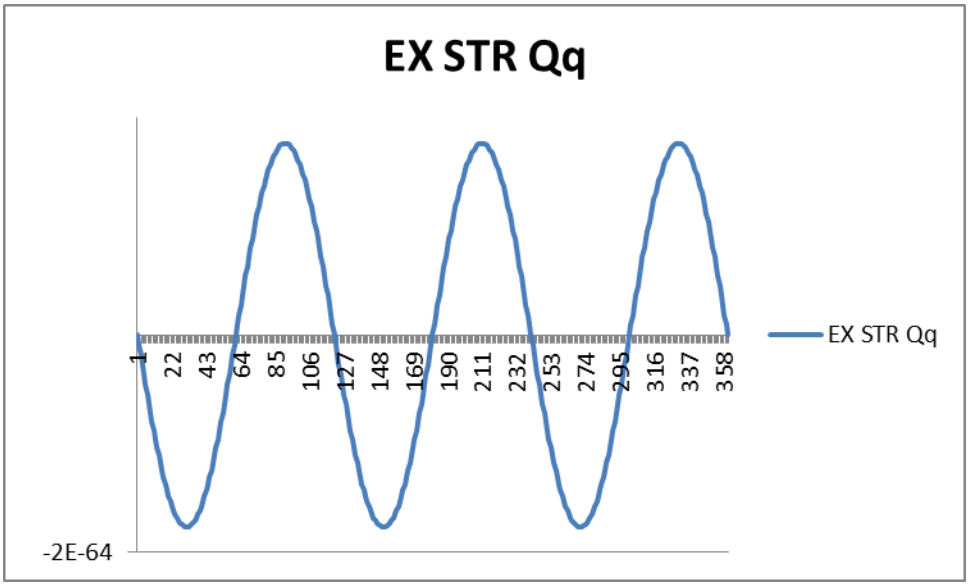

EY M+Q TOT
1
24
47
70
93
116
139
162
185
208
231
254
277
300
323
346
-2.02E-38
EY M+Q TOT

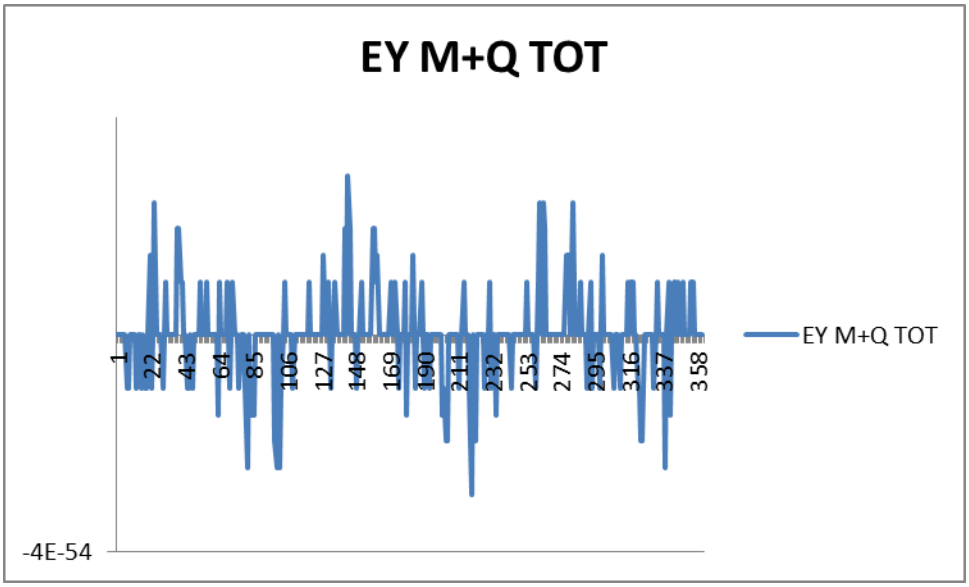
e- neutri DDA 2.4 same
10^17 rot id=10^16
offset 30o w1=w2 k=2x10^-13



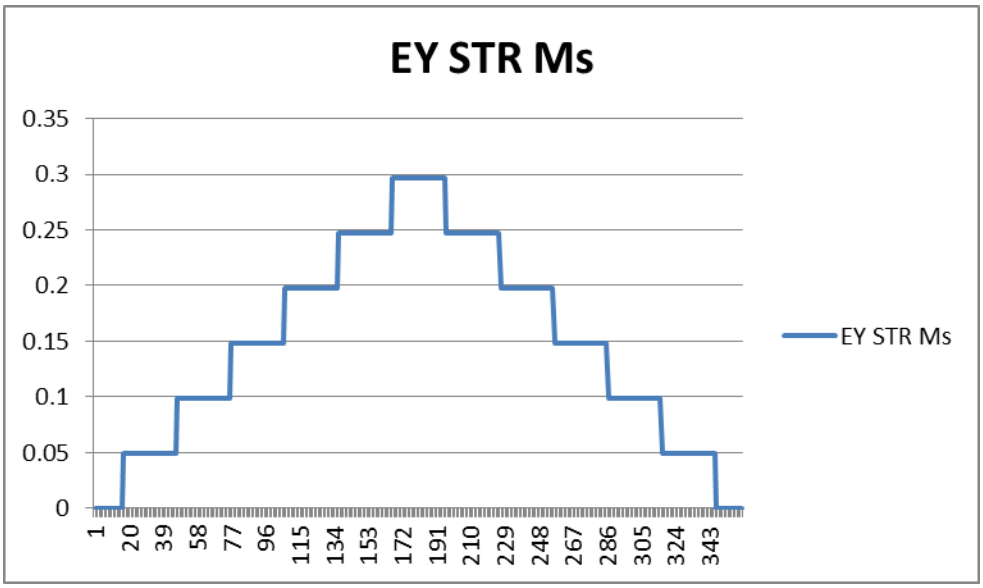


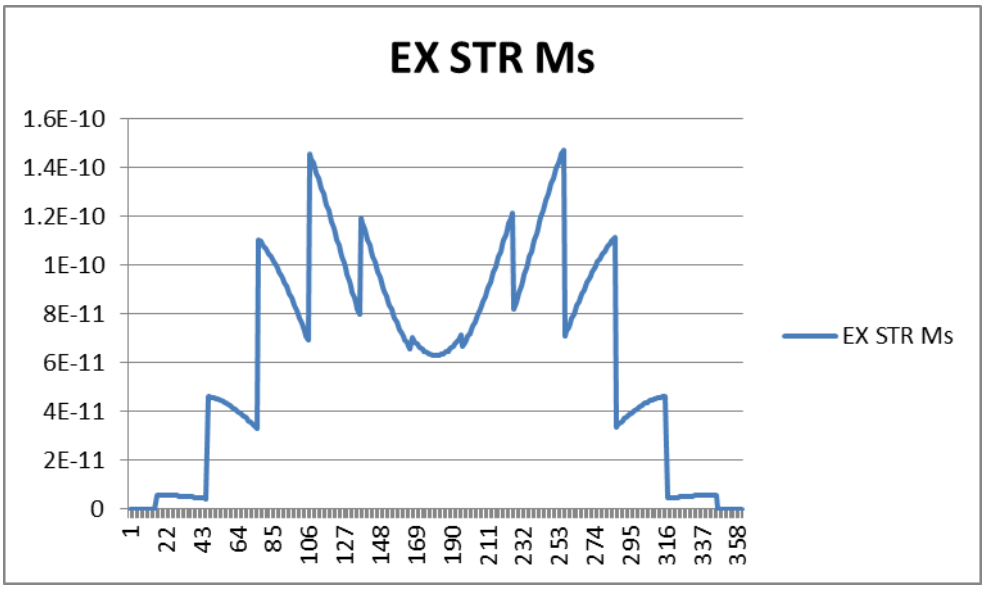


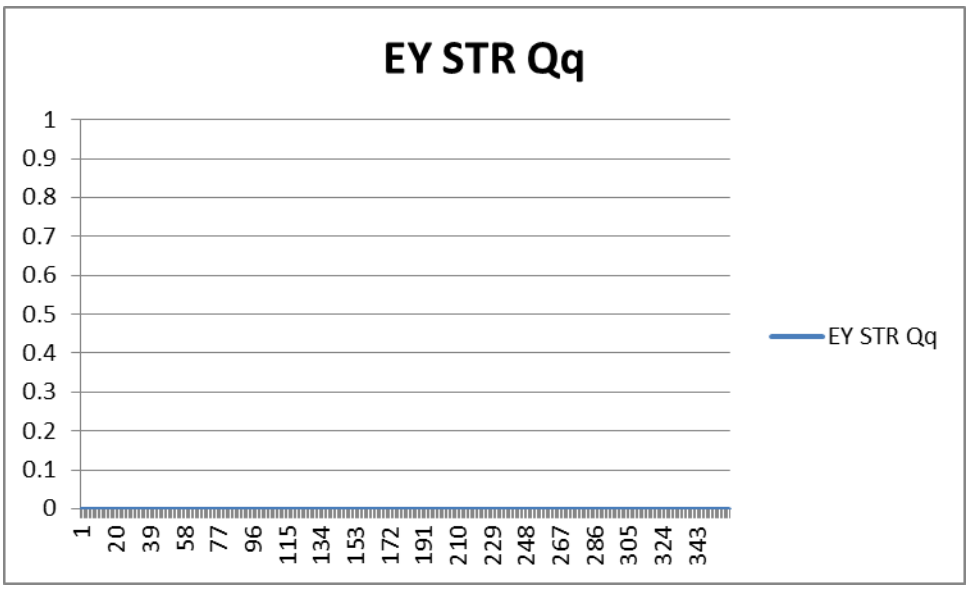

EX STR Qq
1
22
43
64
85
106
127
148
169
190
211
232
253
274
295
316
337
358
-2E-64
EX STR Qq

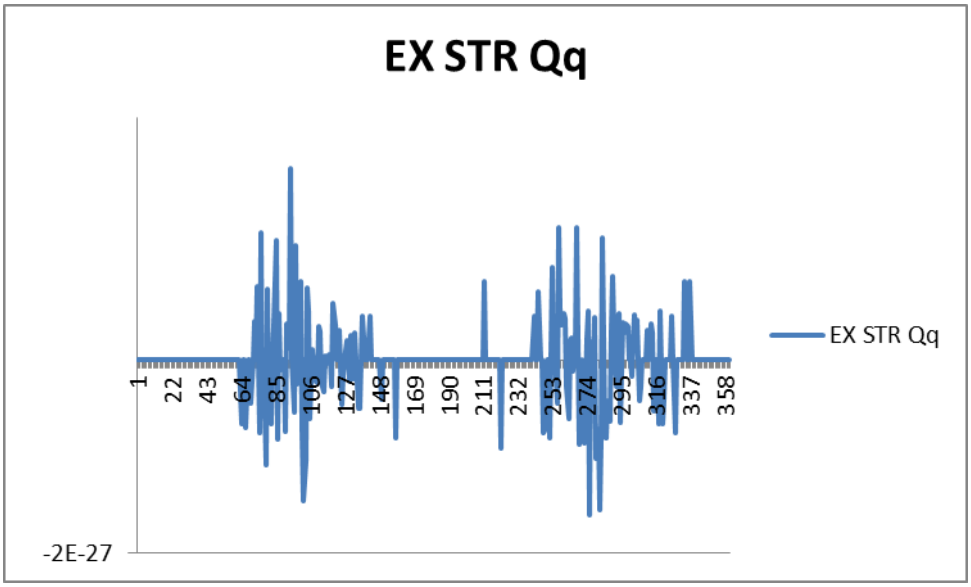

EY M+Q TOT
1
22
43
64
85
106
127
148
169
190
211
232
253
274
295
316
337
358
-4E-54
EY M+Q TOT

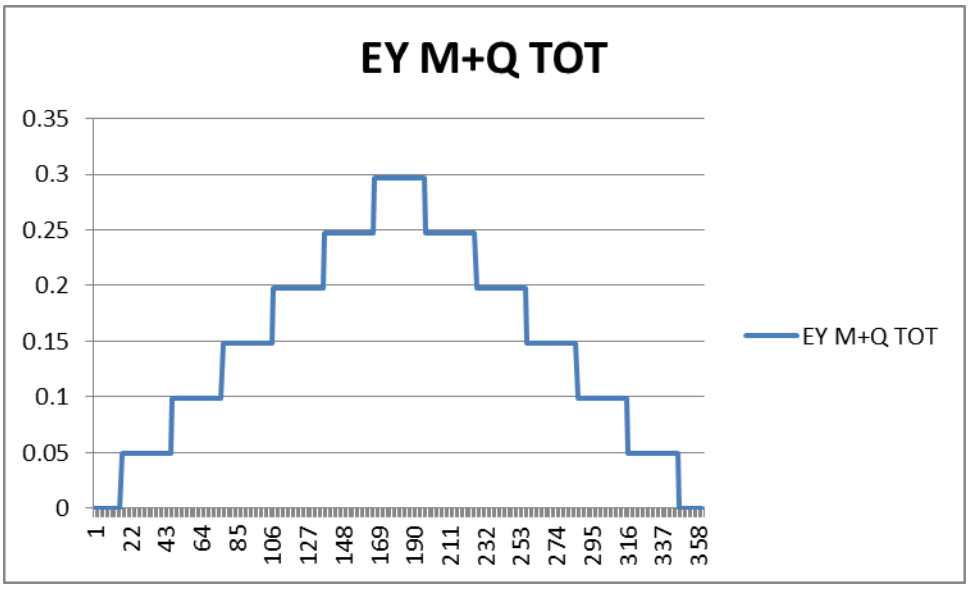
e- neutri DDA 2.4 10^13 same rot id=10^16
offset 30o w1=w2 k=2x10^-13



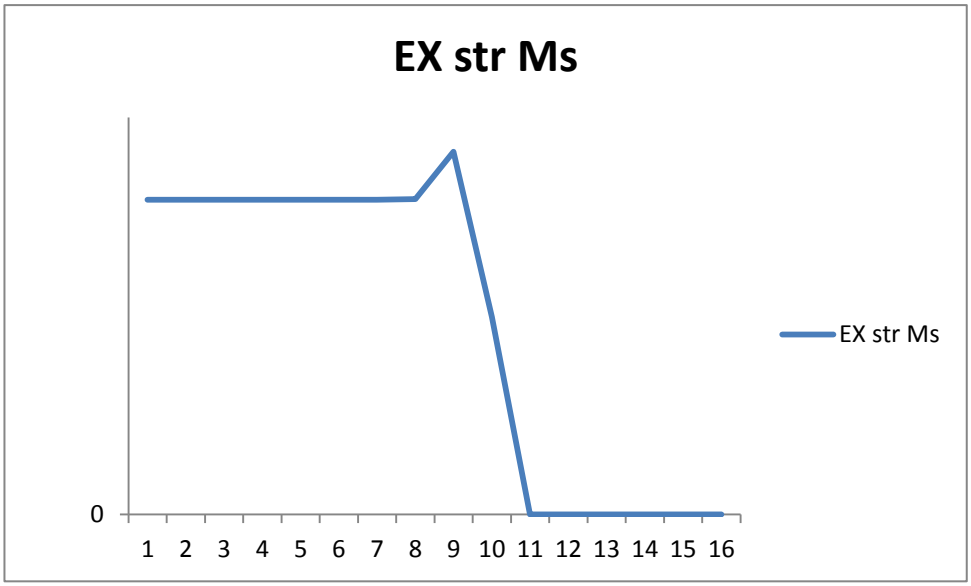


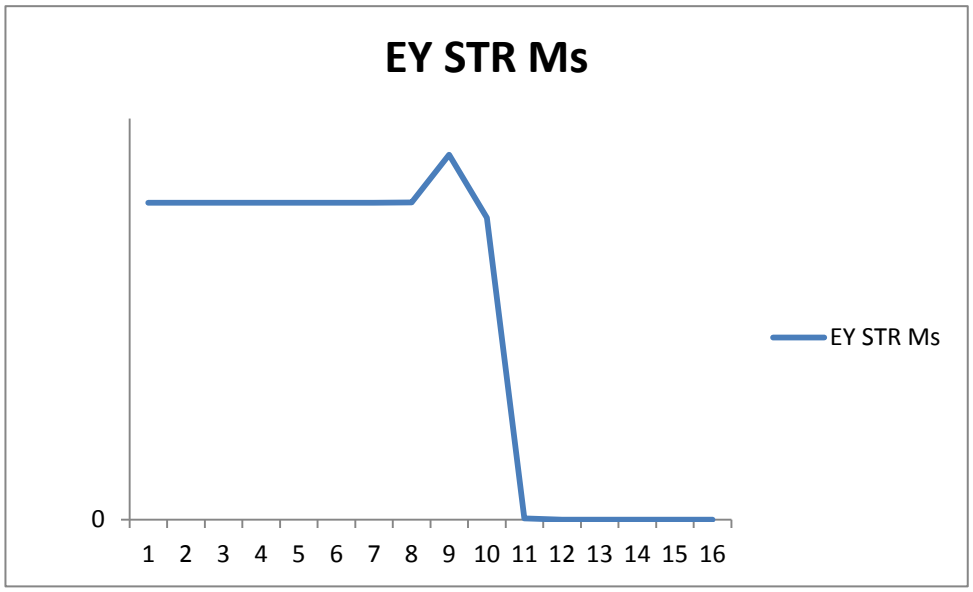


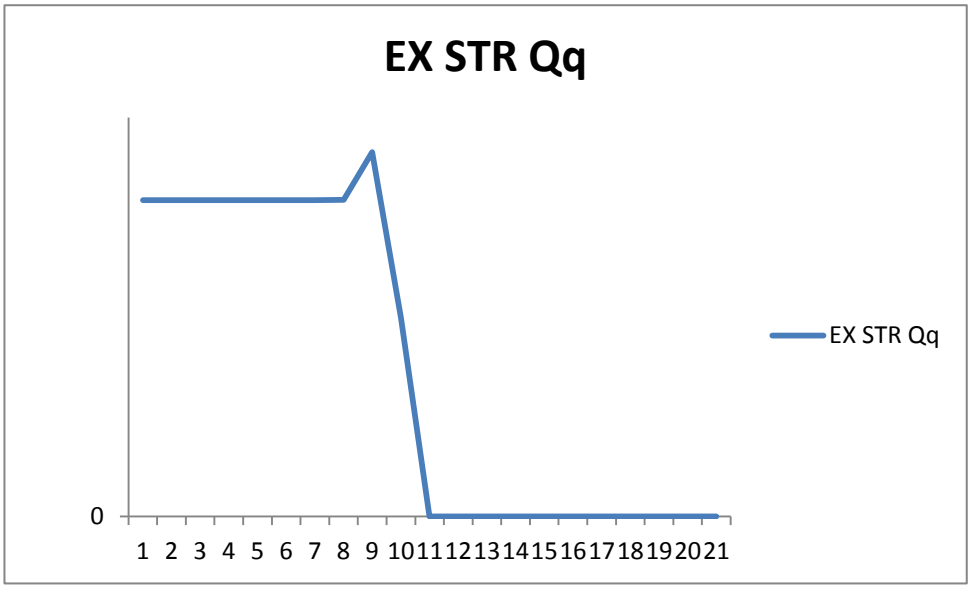

EX STR Qq
-2E-27
1
22
43
64
85
106
127
148
169
190
211
232
253
274
295
316
337
358
EX STR Qq

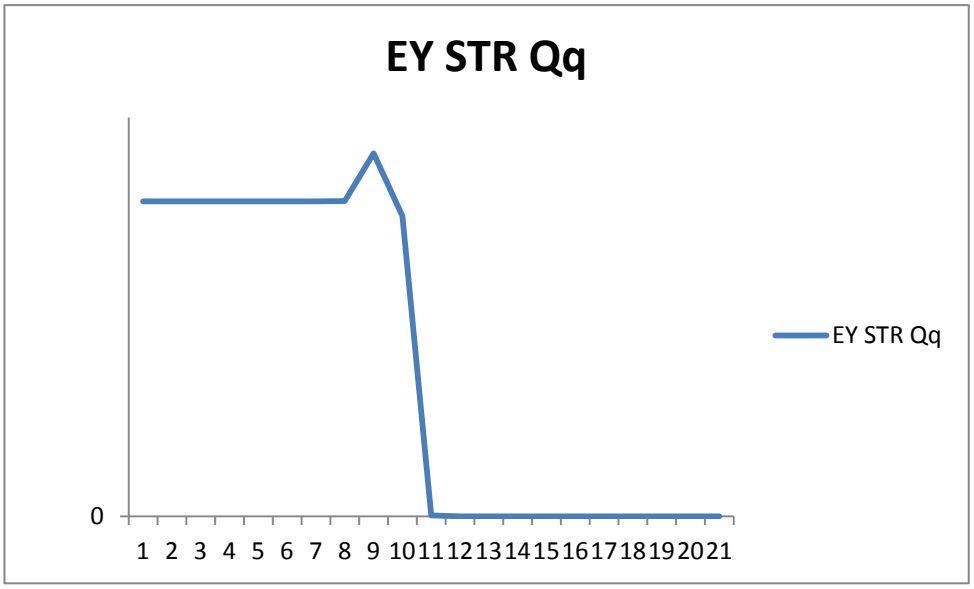

EY M+Q TOT
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
1
22
43
64
85
106
127
148
169
190
211
232
253
274
295
316
337
358
EY M+Q TOT

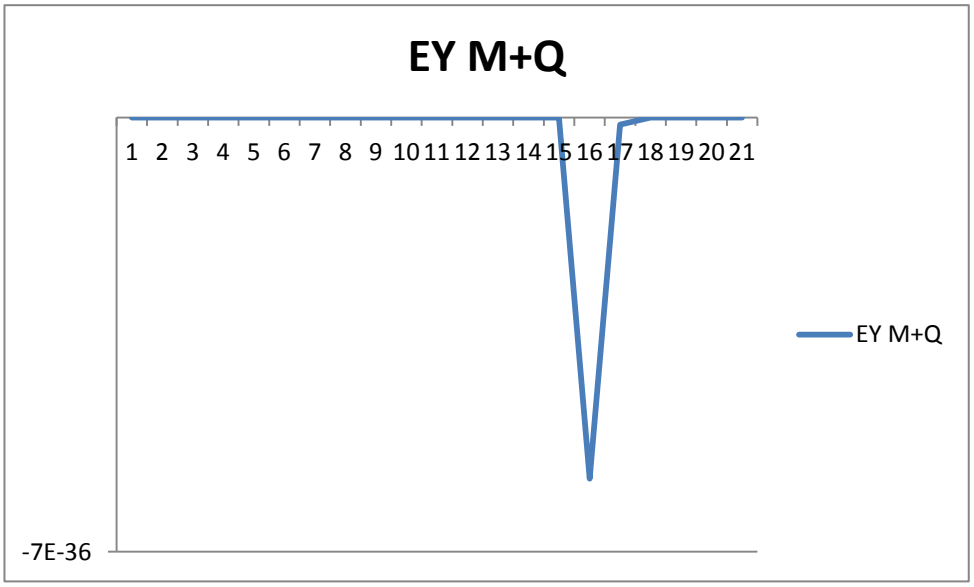
using M,Q as 1 and s,q as q(e-, e-) DDA 1 - 10^21



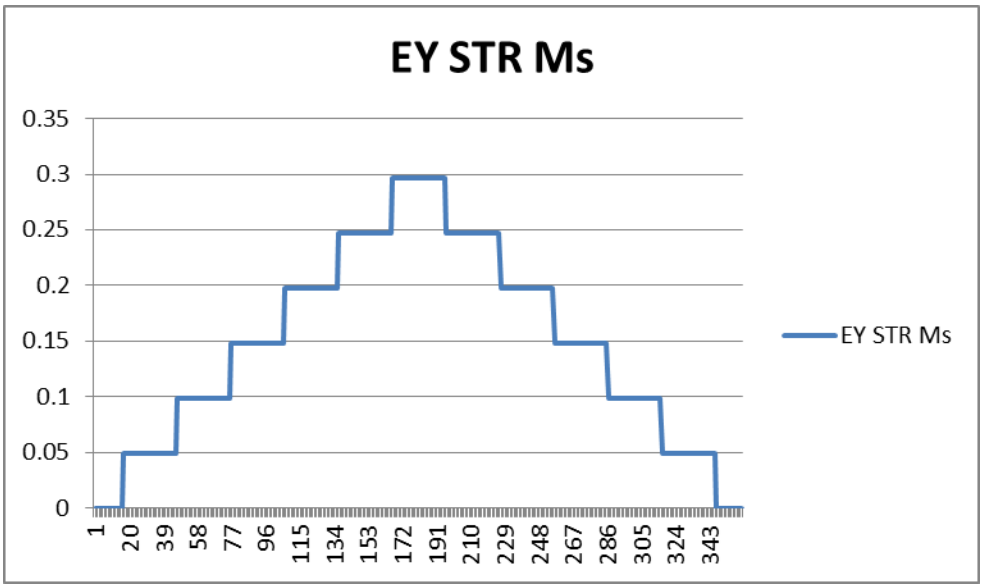


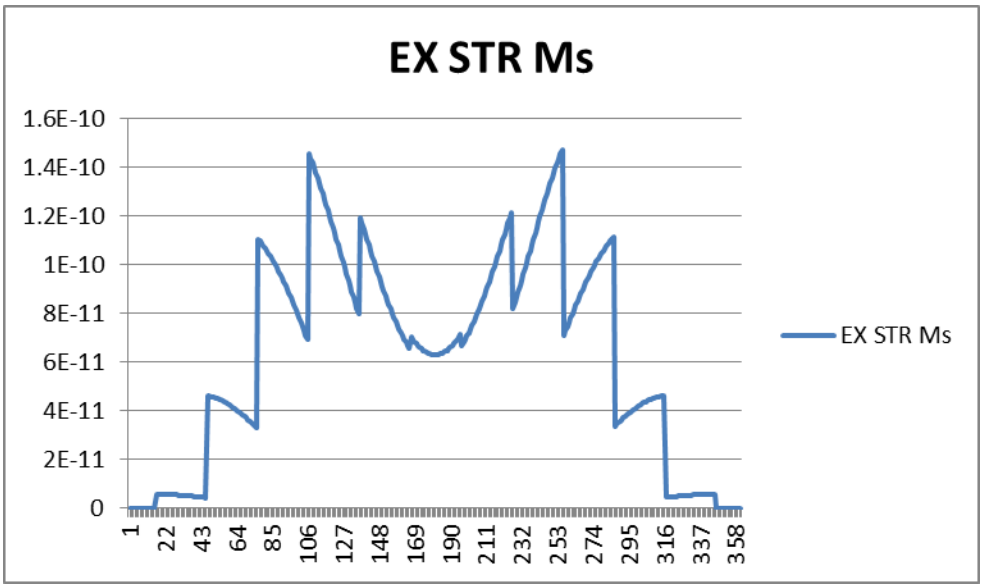


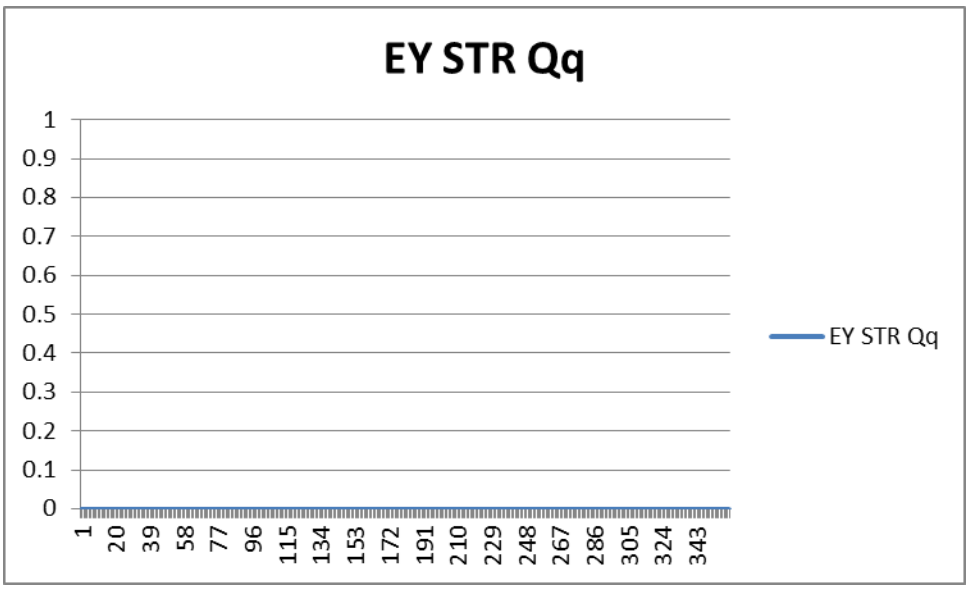

EY STR Qq
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21
EY STR Qq

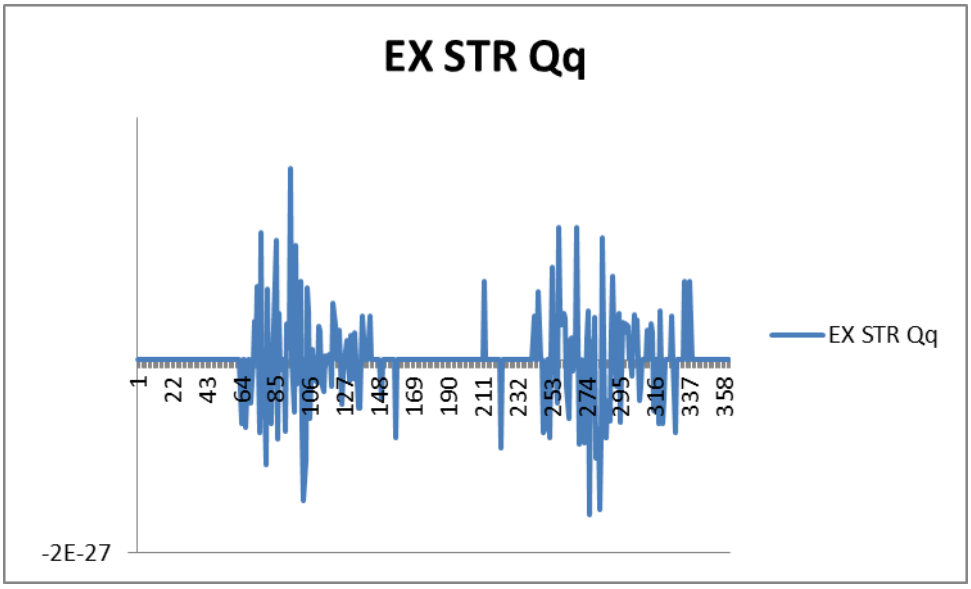

EY M+Q
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21
-7E-36
EY M+Q

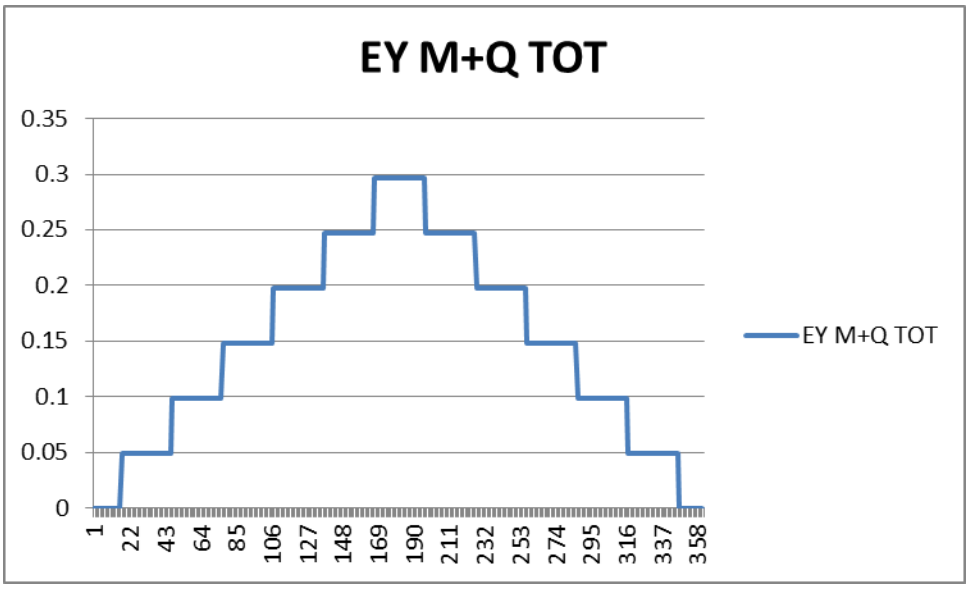
e-e- DDA 2.4 10^13 same rot id=10^16
offset 30o w1=w2 k=2x10^-13



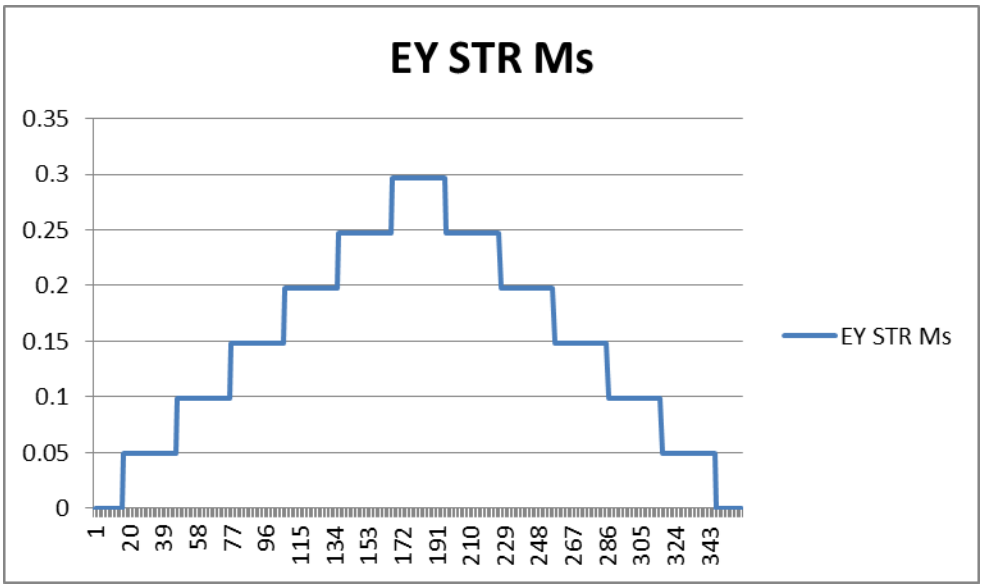


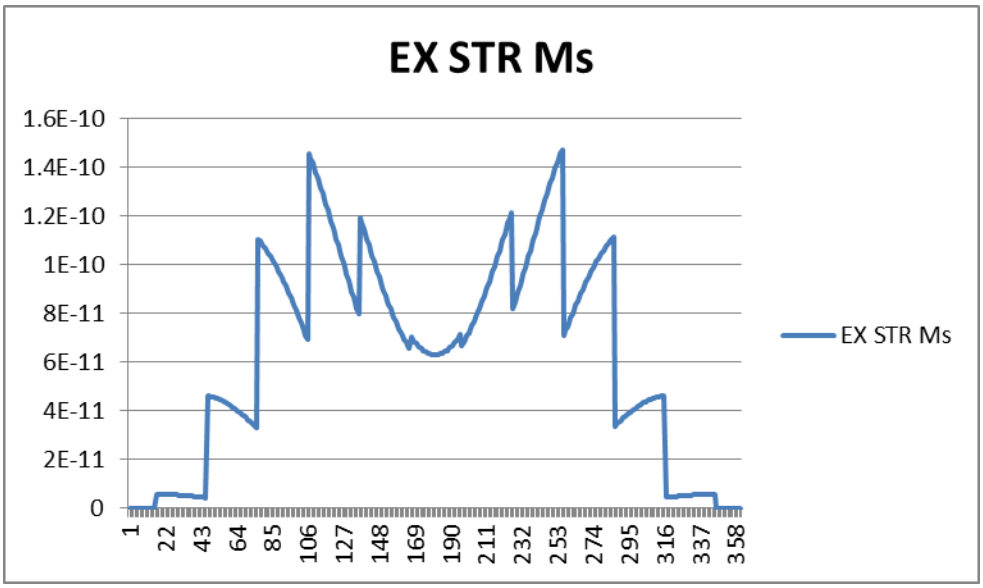


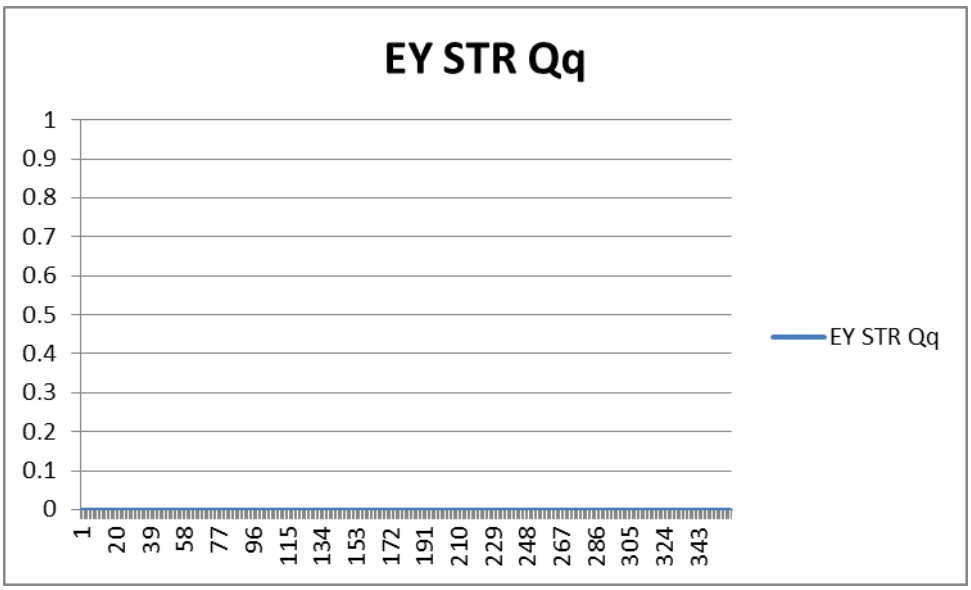

EX STR Qq
-2E-27
1
22
43
64
85
106
127
148
169
190
211
232
253
274
295
316
337
358
EX STR Qq

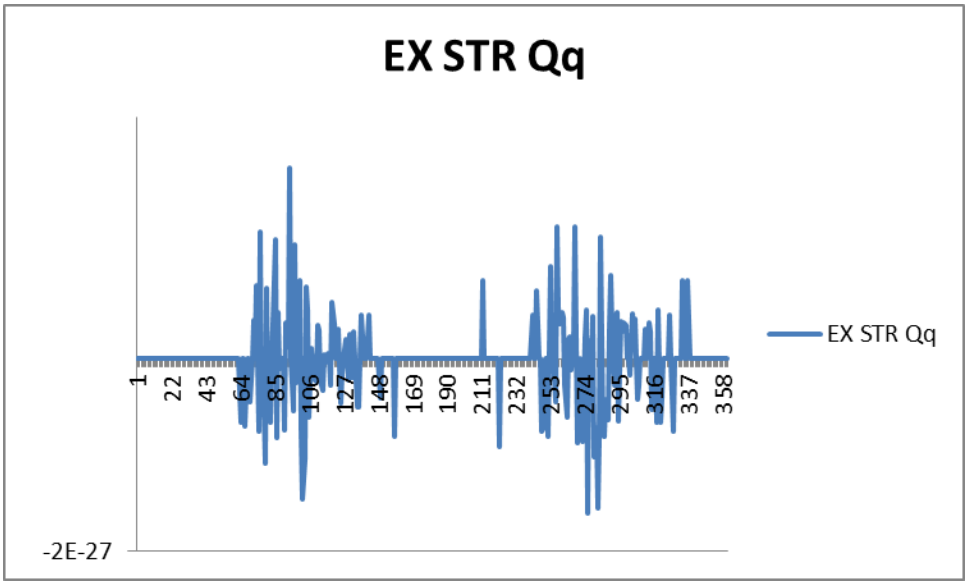

EY M+Q TOT
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
1
22
43
64
85
106
127
148
169
190
211
232
253
274
295
316
337
358
EY M+Q TOT

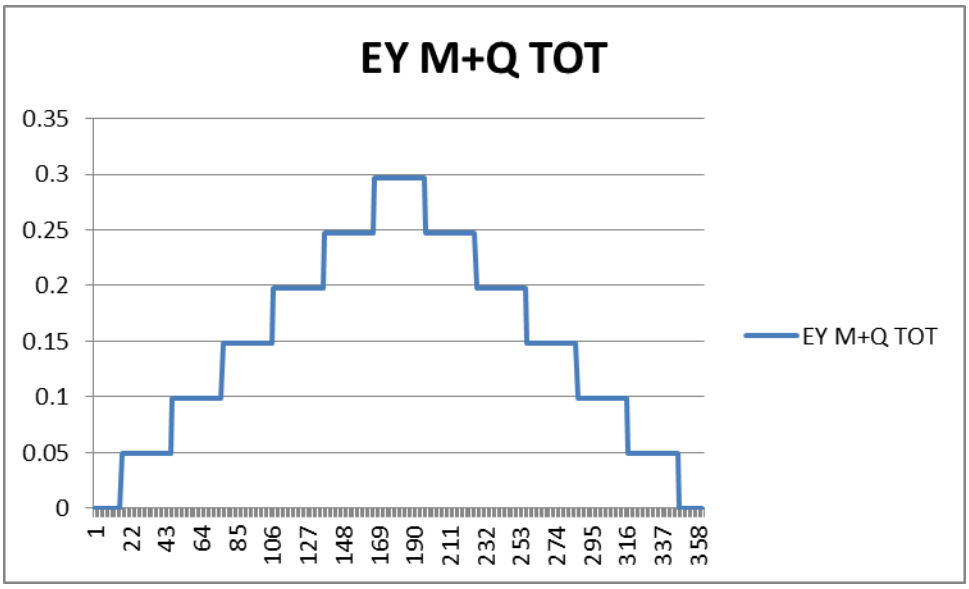
e-e+- DDA 2.4 10^13 same rot id=10^16
offset 30o w1=w2 k=2x10^-13







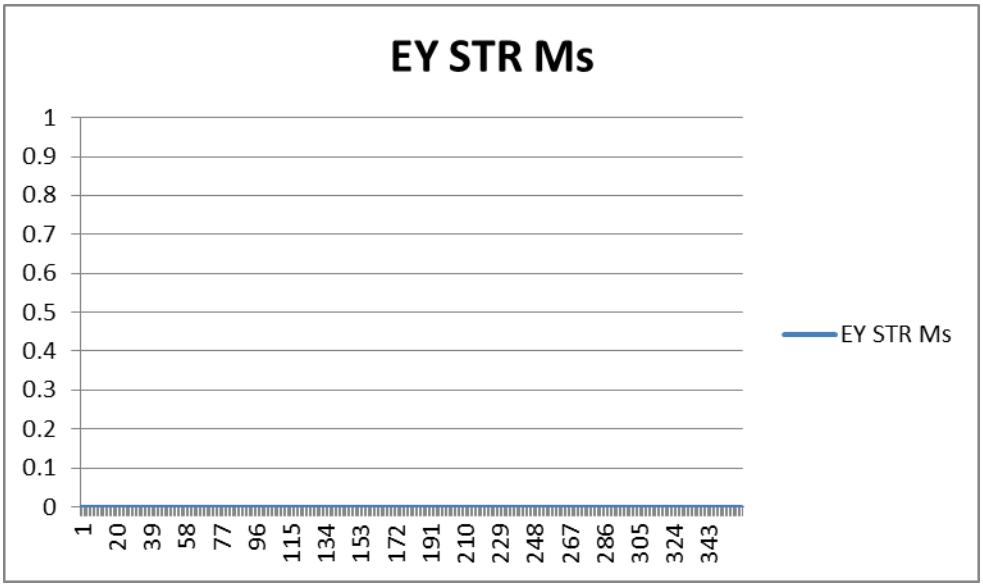

EX STR Qq
-2E-27
1
22
43
64
85
106
127
148
169
190
211
232
253
274
295
316
337
358
EX STR Qq

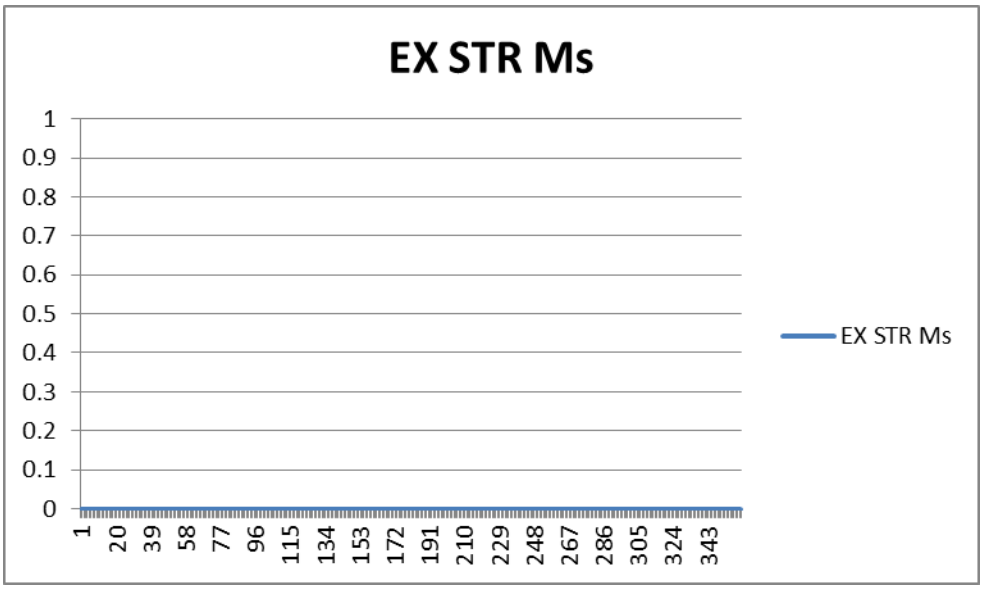

EY M+Q TOT
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
1
22
43
64
85
106
127
148
169
190
211
232
253
274
295
316
337
358
EY M+Q TOT

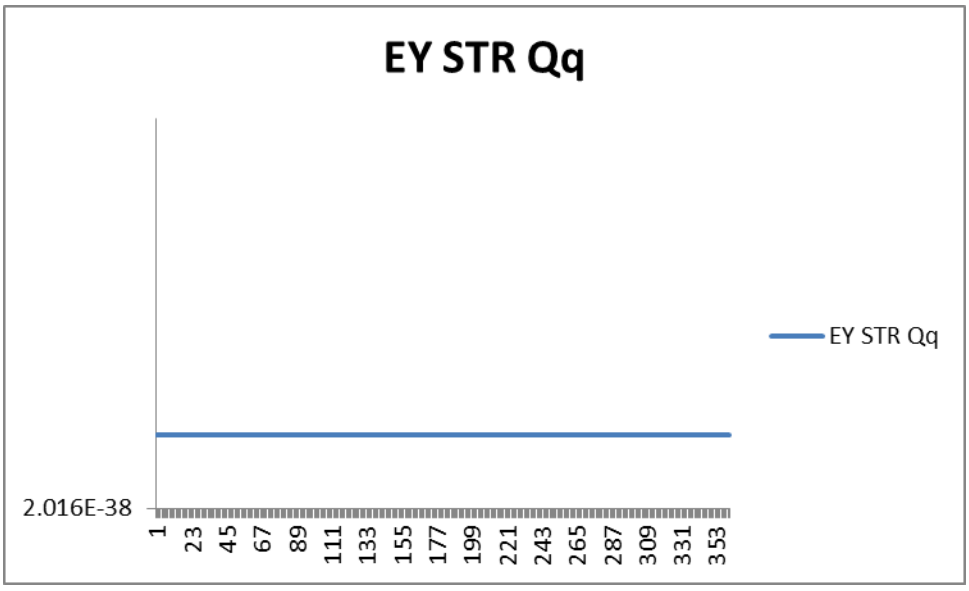
same

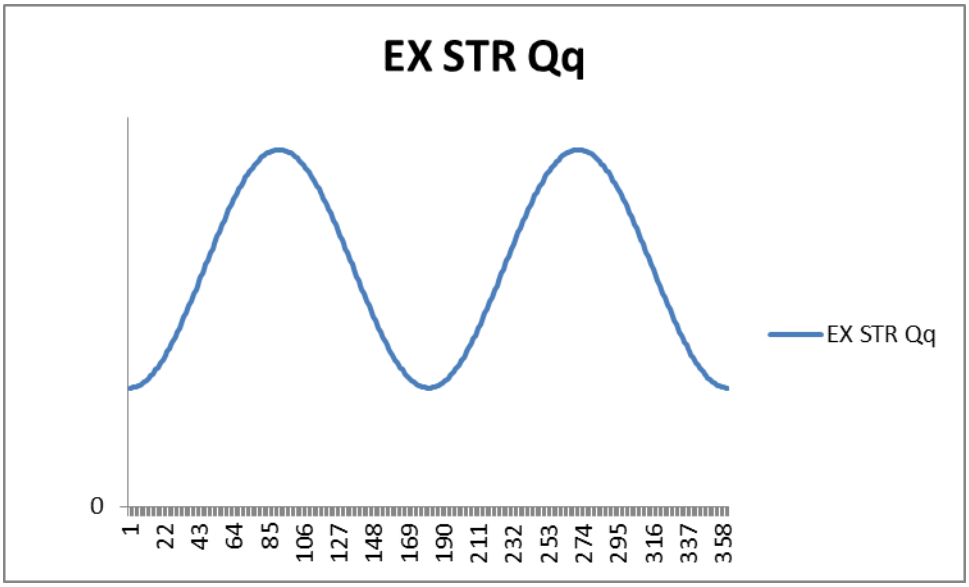
e-e- DDA 2.4 10^17 rot id=10^16

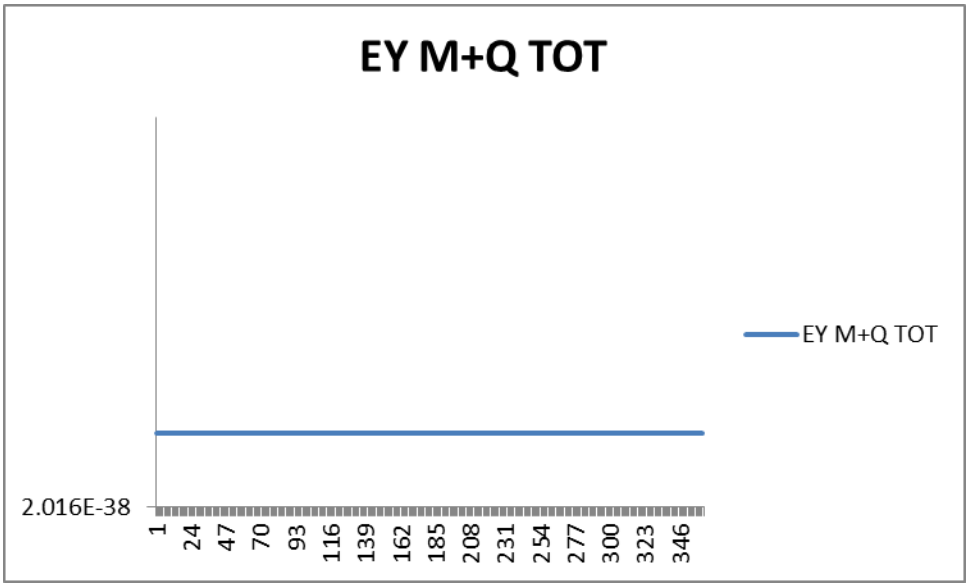
offset 30o w1=w2 k=2x10^-13



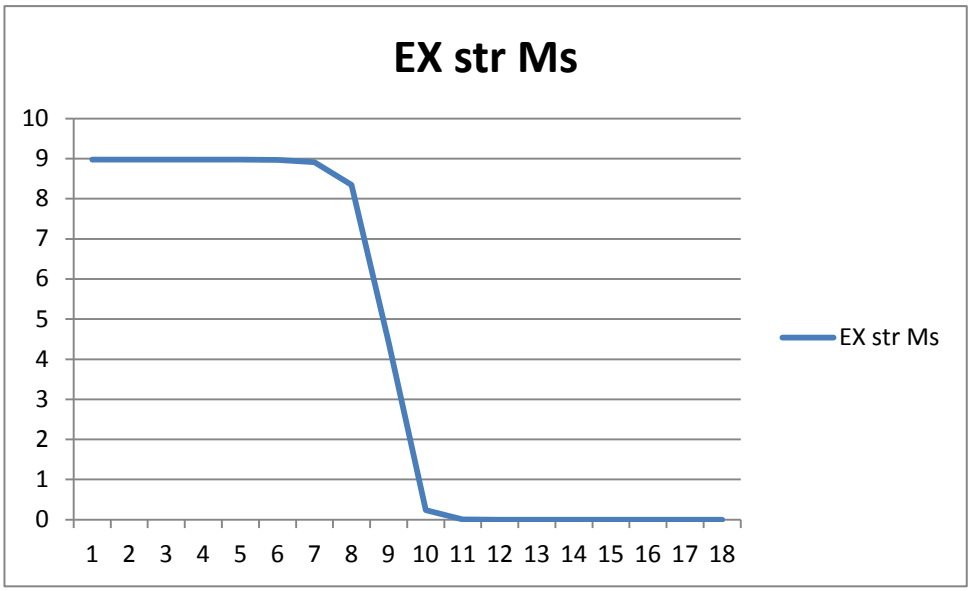


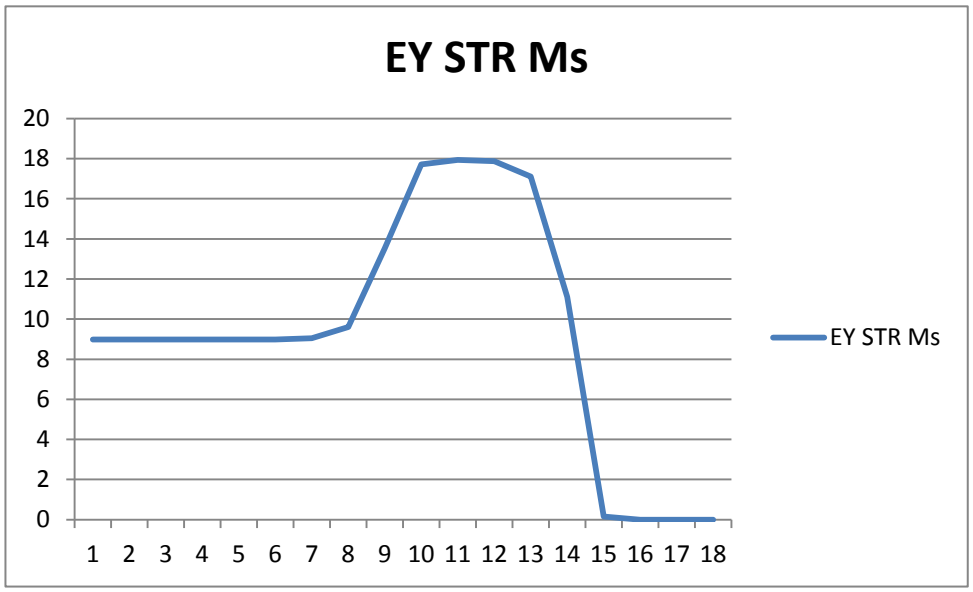


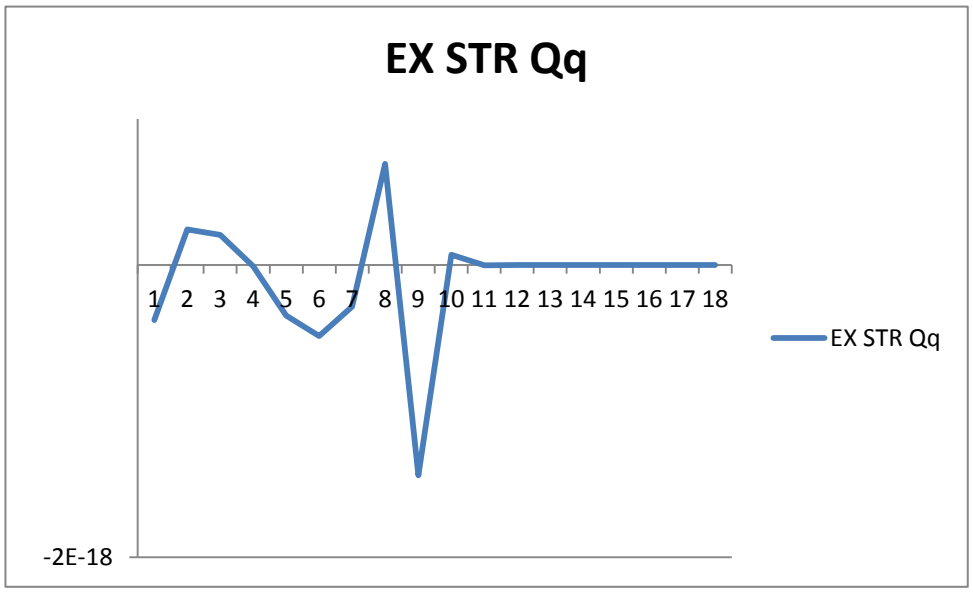

EX STR Qq
0
1
22
43
64
85
106
127
148
169
190
211
232
253
274
295
316
337
358
EX STR Qq

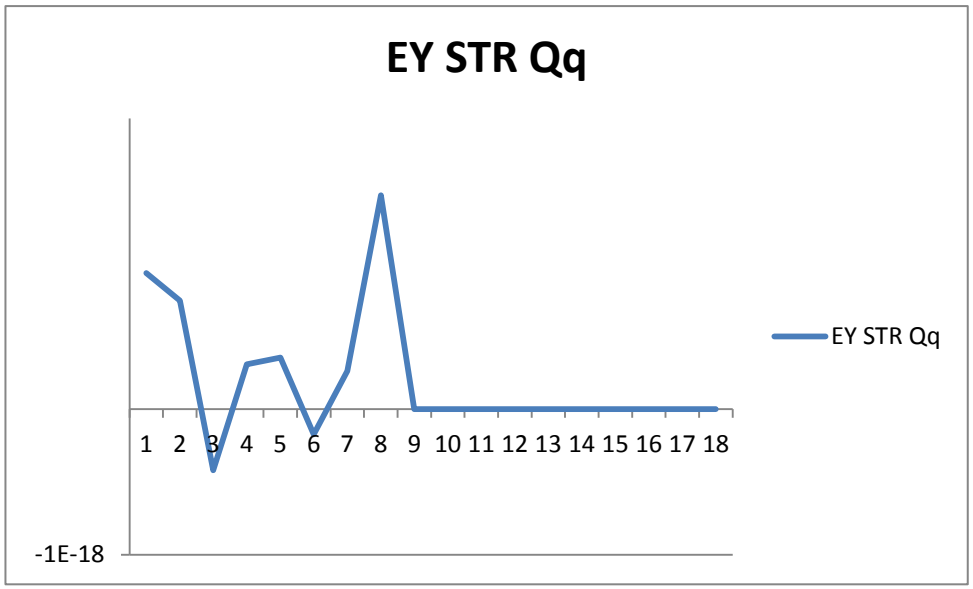

EY M+Q TOT
2.016E-38
1
24
47
70
93
116
139
162
185
208
231
254
277
300
323
346
EY M+Q TOT

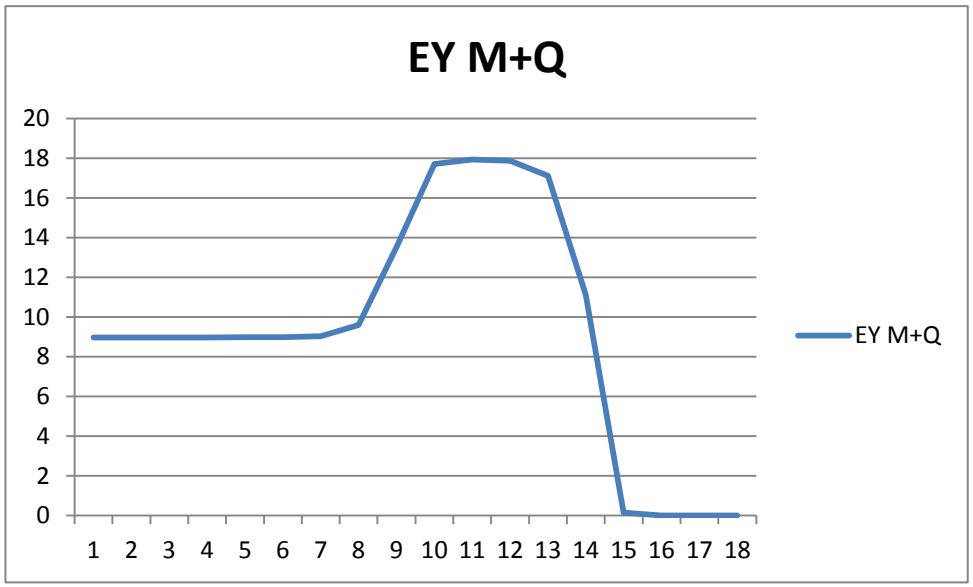
p/7 p/7 loops, M, Q =1.s,q=q/6 DDA 1 - 10^16



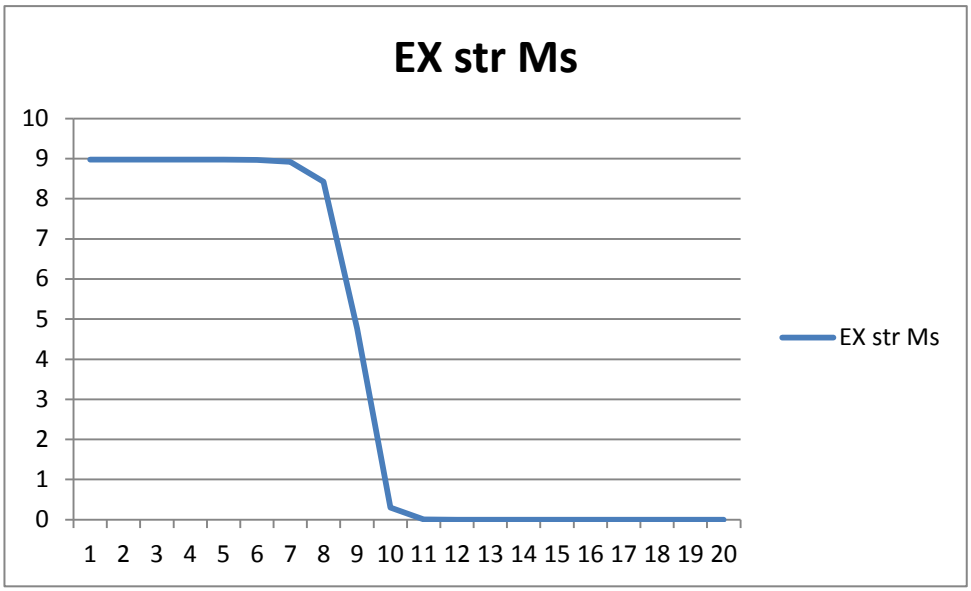


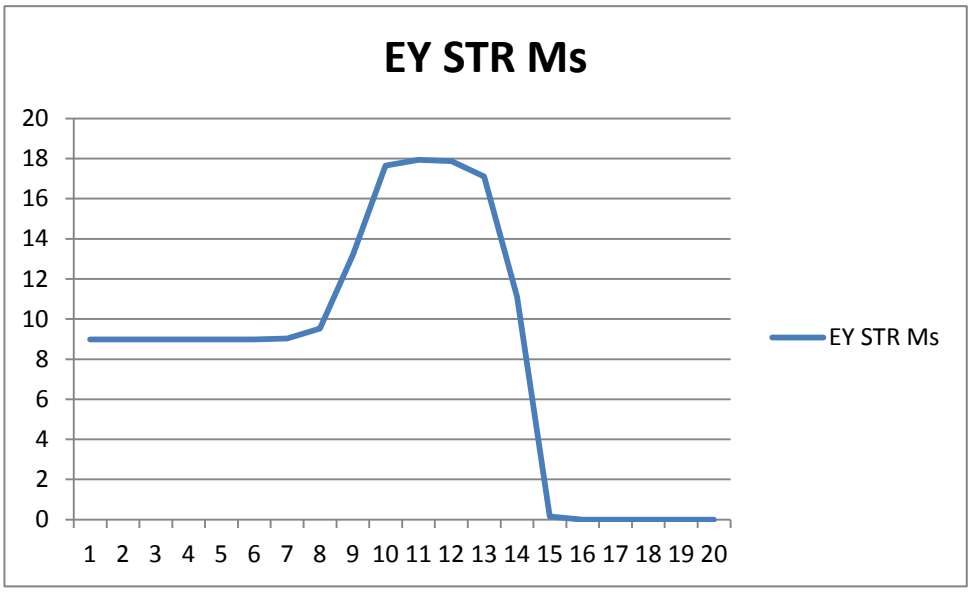


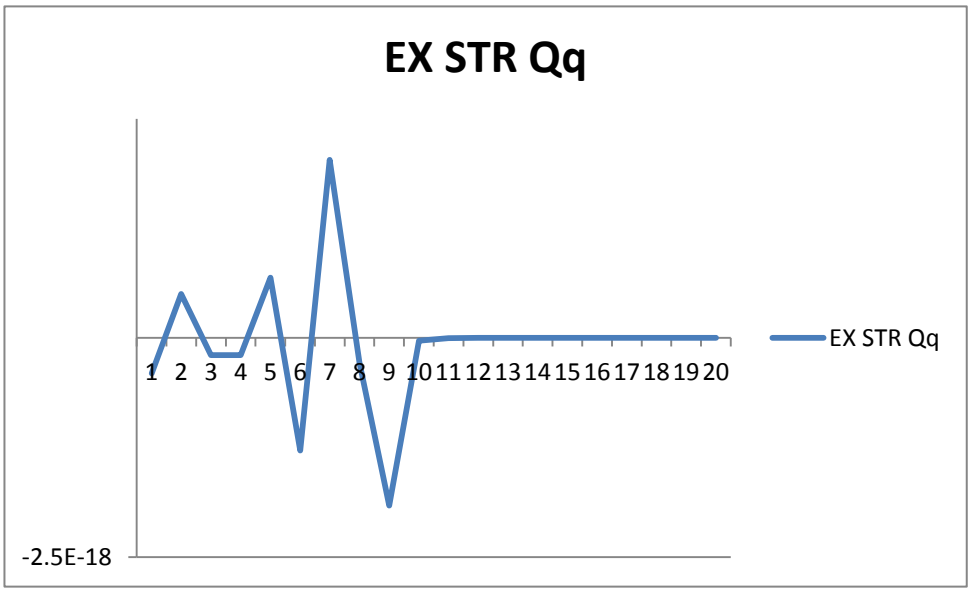

EY STR Qq
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
-1E-18
EY STR Qq

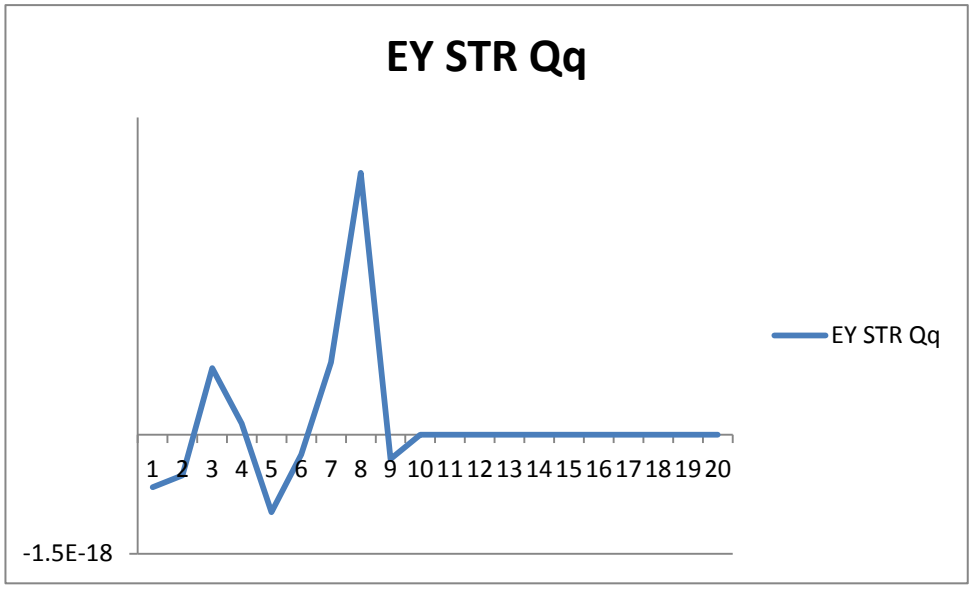

EY M+Q
20
18
16
14
12
10
8
6
4
2
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
EY M+Q

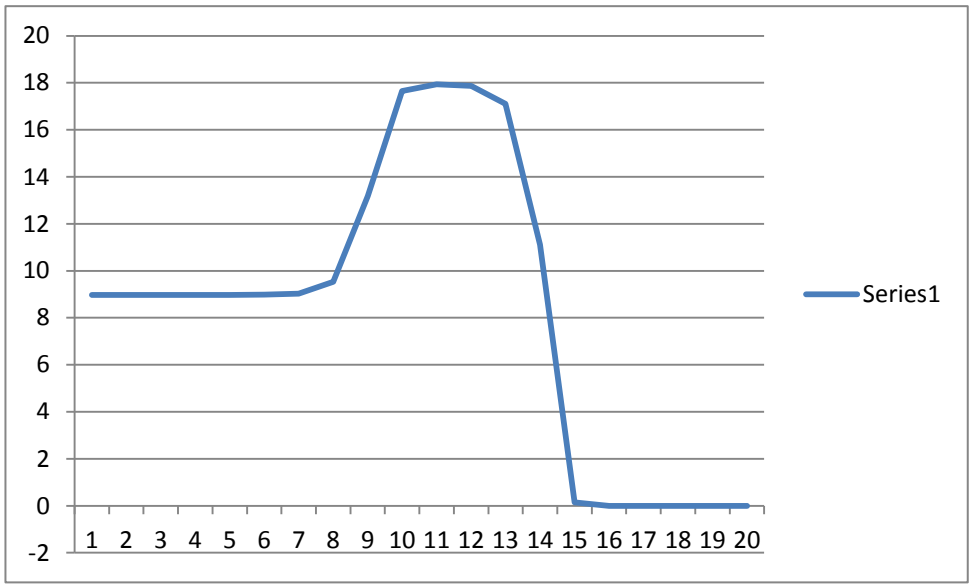
p-/9 p-/9 loops, M, Q =1.s,q=q/6 DDA 1 -10^18



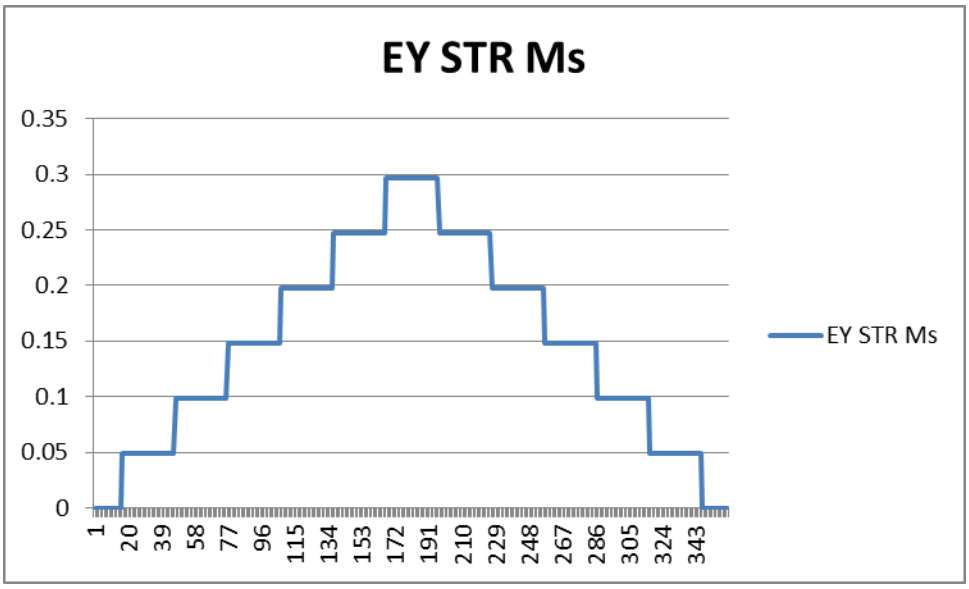


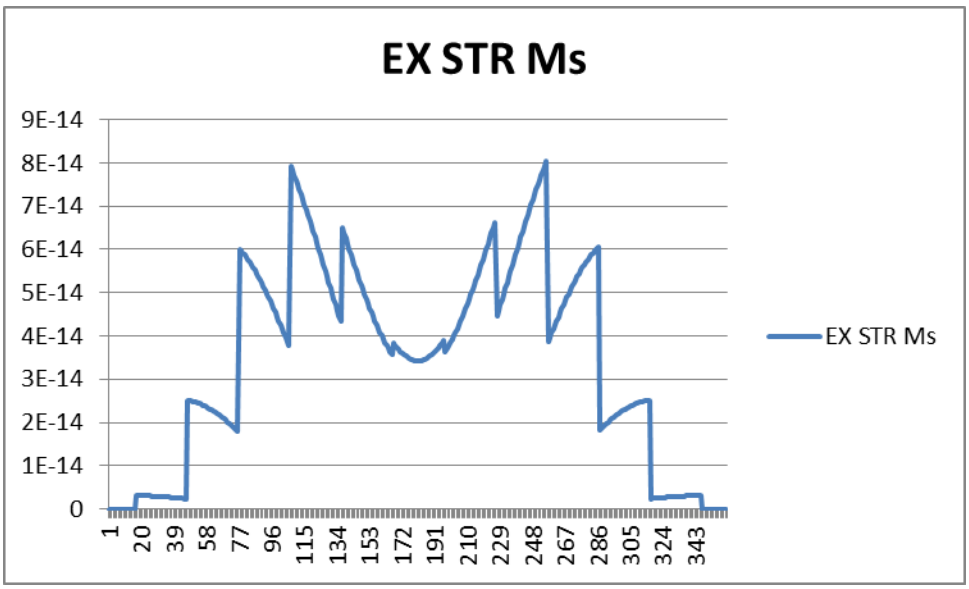


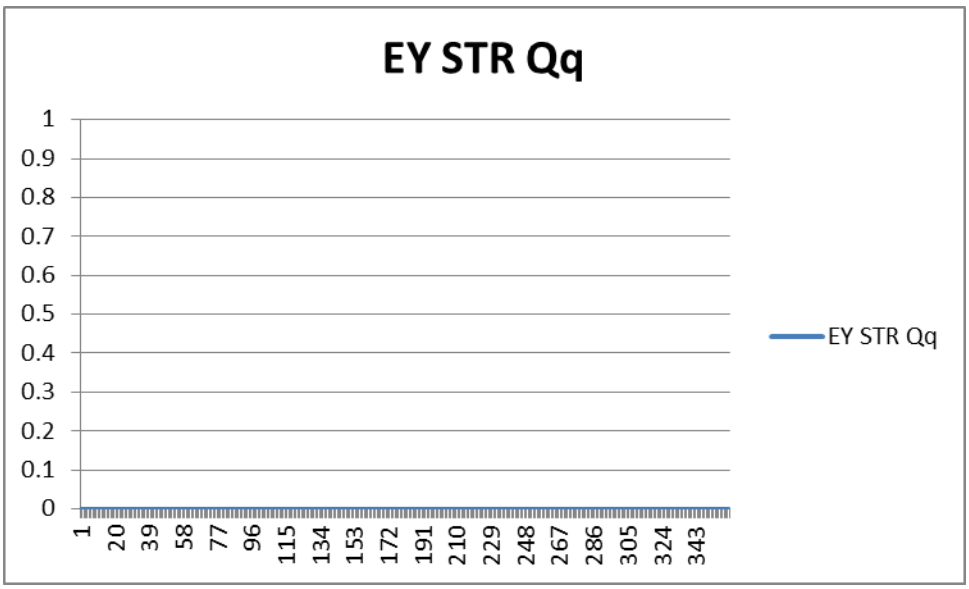

EY STR Qq
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
-1.5E-18
EY STR Qq

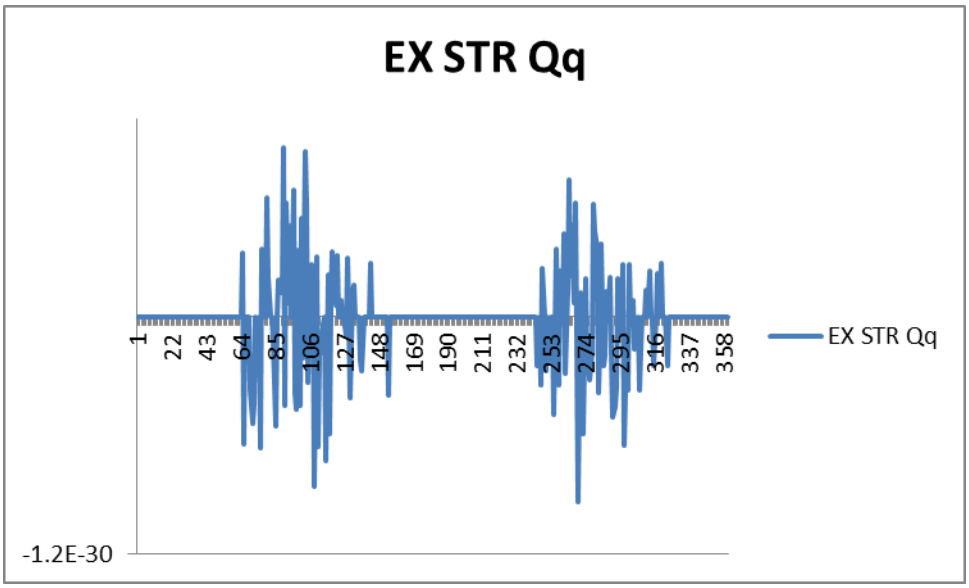

20
18
16
14
12
10
8
6
4
2
0
-2
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
Series1

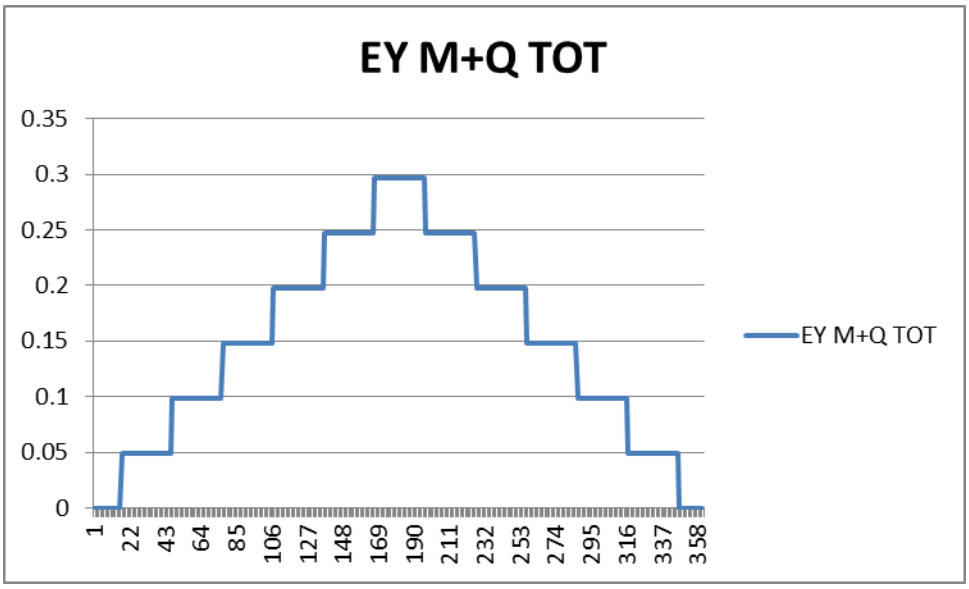
p+ no DDA 2.4 10^13 same rot id=10^16
offset 30o w1=w2 k=2x10^-13







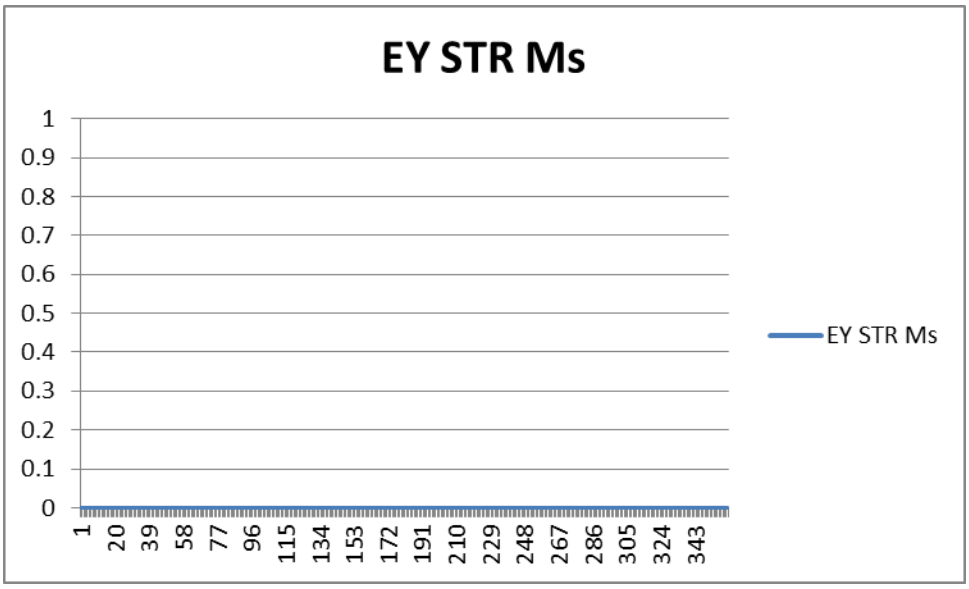

EX STR Qq
-1.2E-30
1
22
43
64
85
106
127
148
169
190
211
232
253
274
295
316
337
358
EX STR Qq

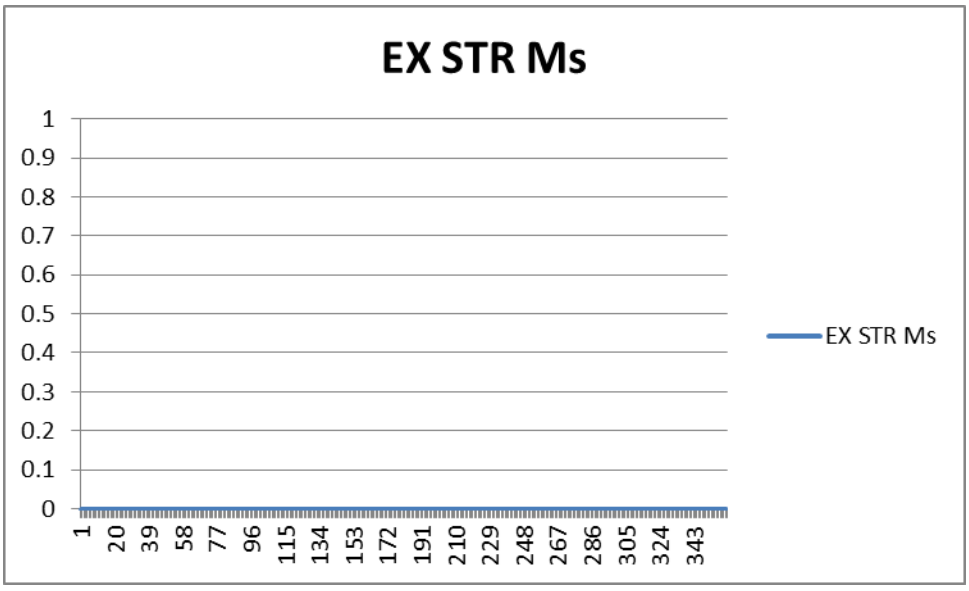

EY M+Q TOT
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
1
22
43
64
85
106
127
148
169
190
211
232
253
274
295
316
337
358
EY M+Q TOT

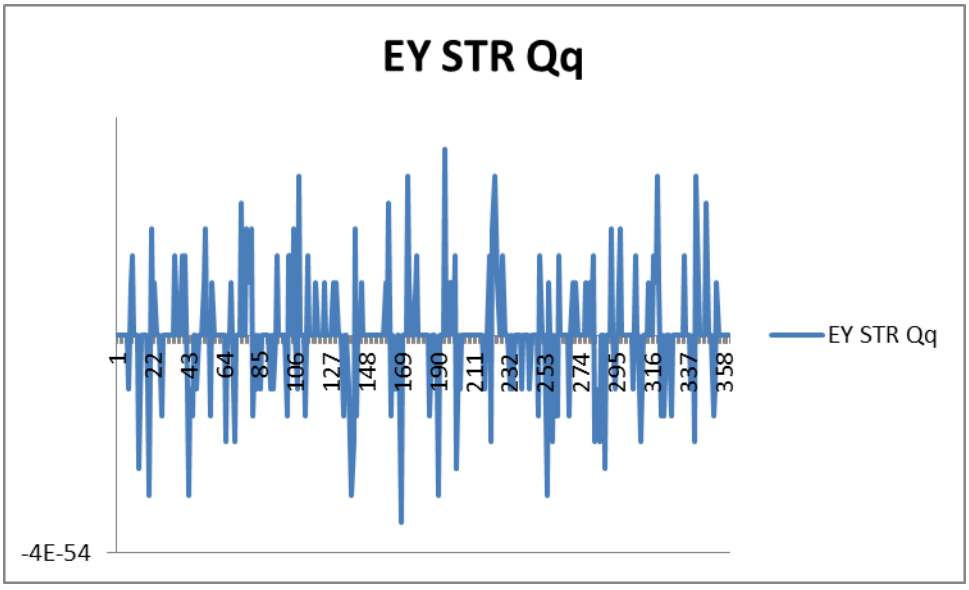
same

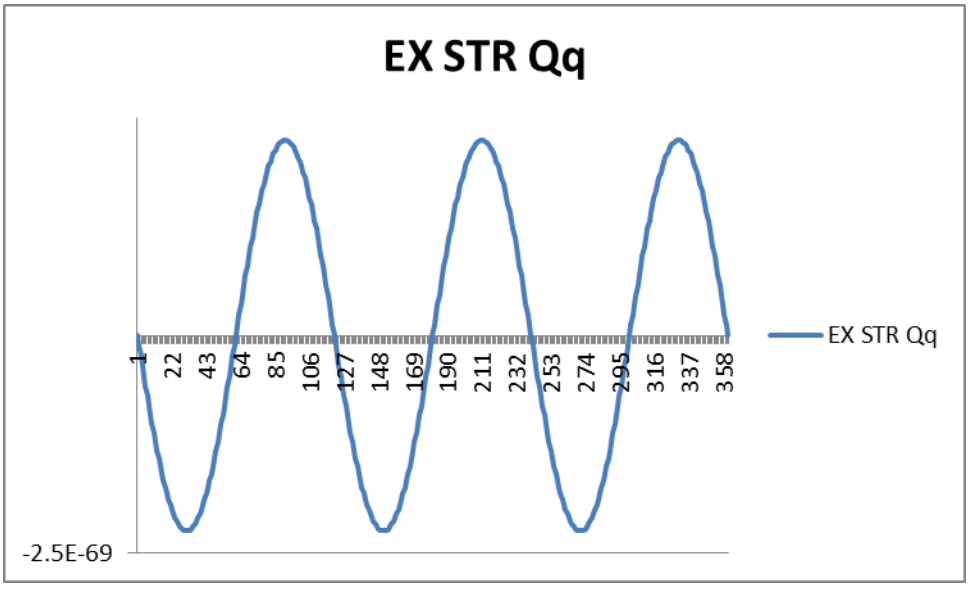
p+ no DDA 2.4 10^17 rot id=10^16

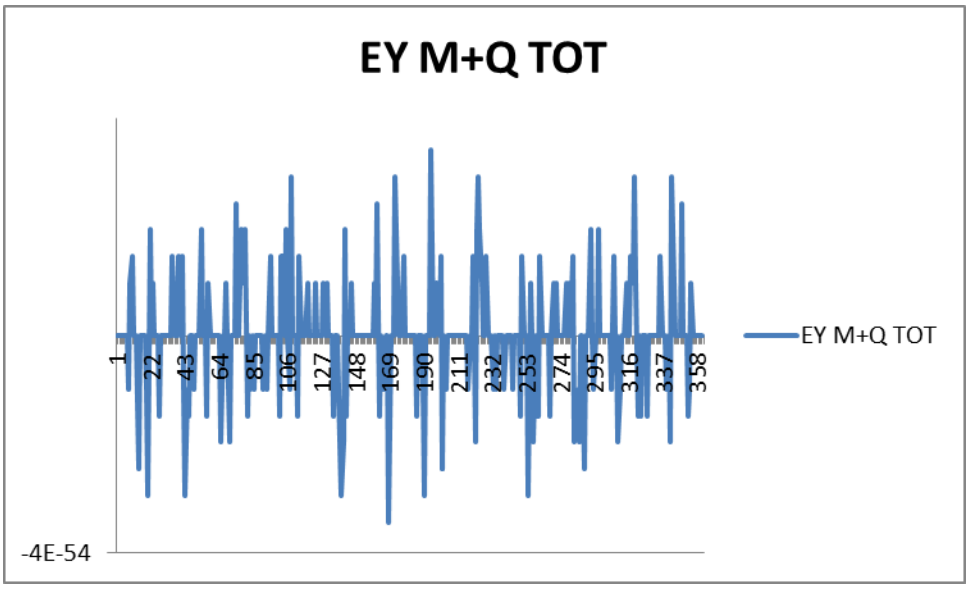
offset 30o w1=w2 k=2x10^-13



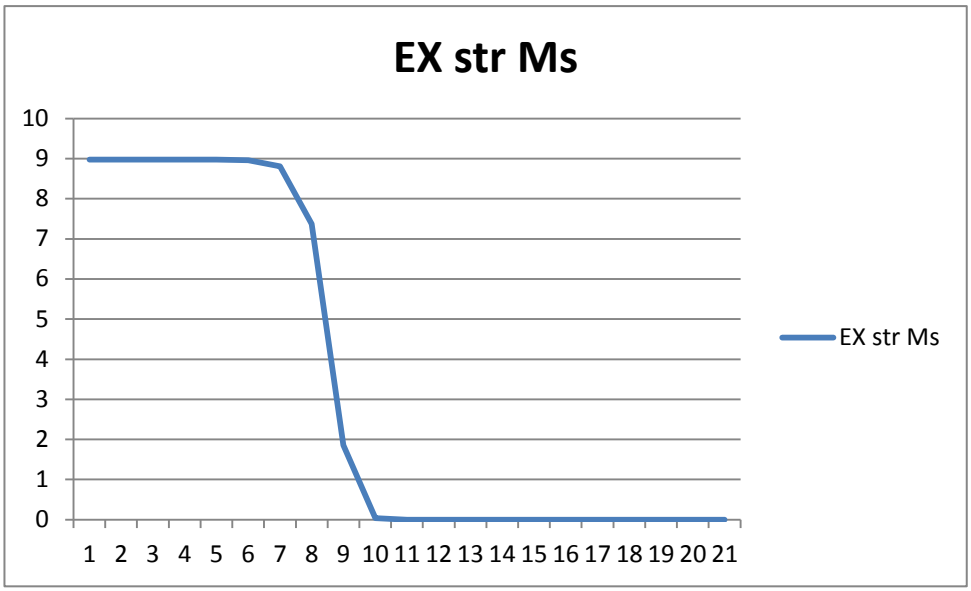


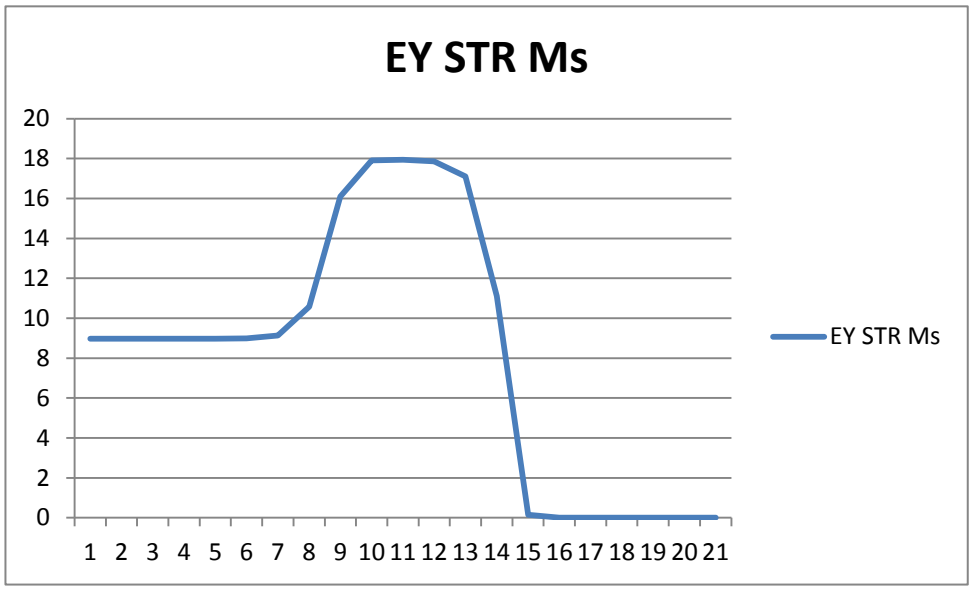


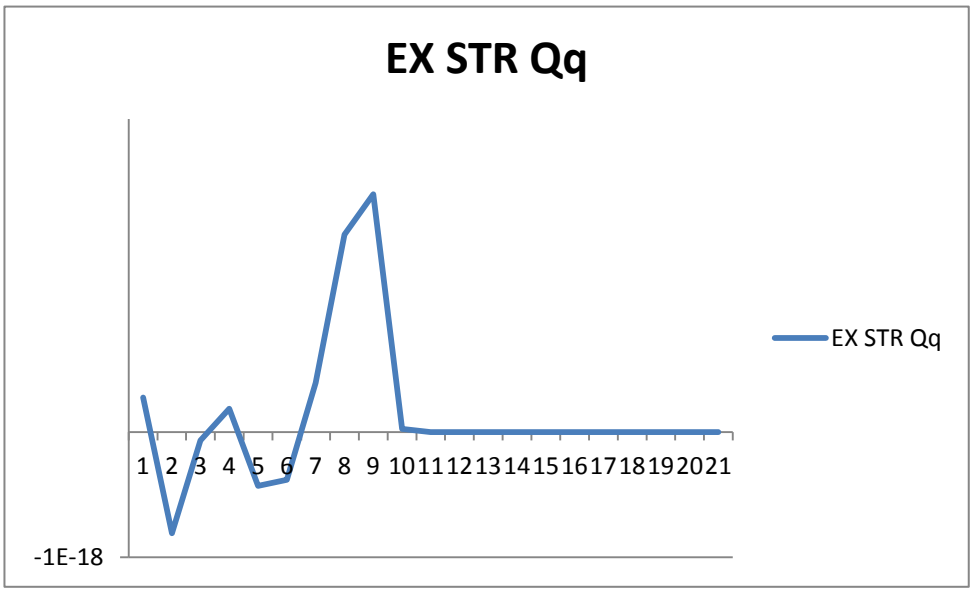

EX STR Qq
1
22
43
64
85
106
127
148
169
190
211
232
253
274
295
316
337
358
EX STR Qq
-2.5E-69

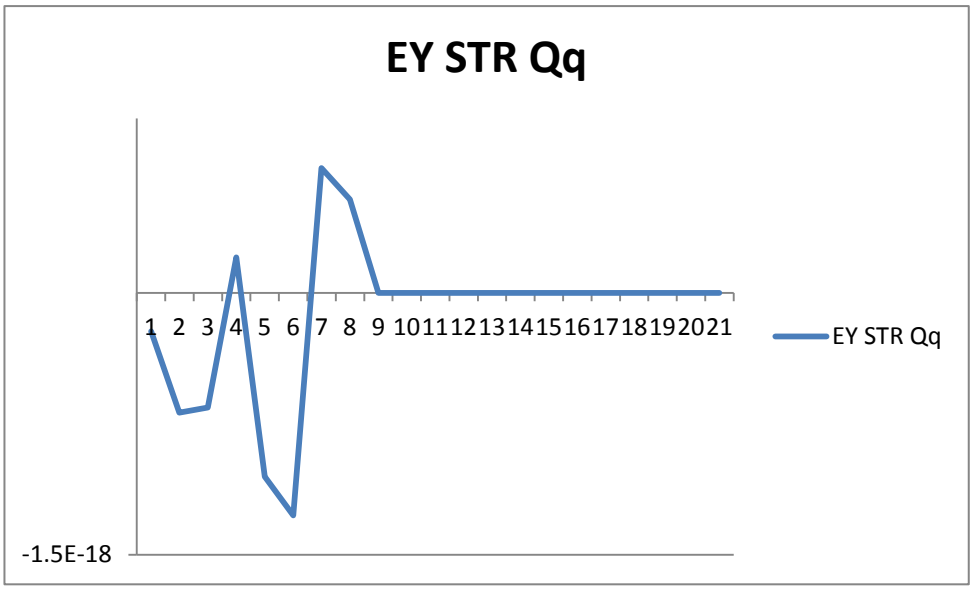

EY M+Q TOT
1
22
43
64
85
106
127
148
169
190
211
232
253
274
295
316
337
358
EY M+Q TOT
-4E-54

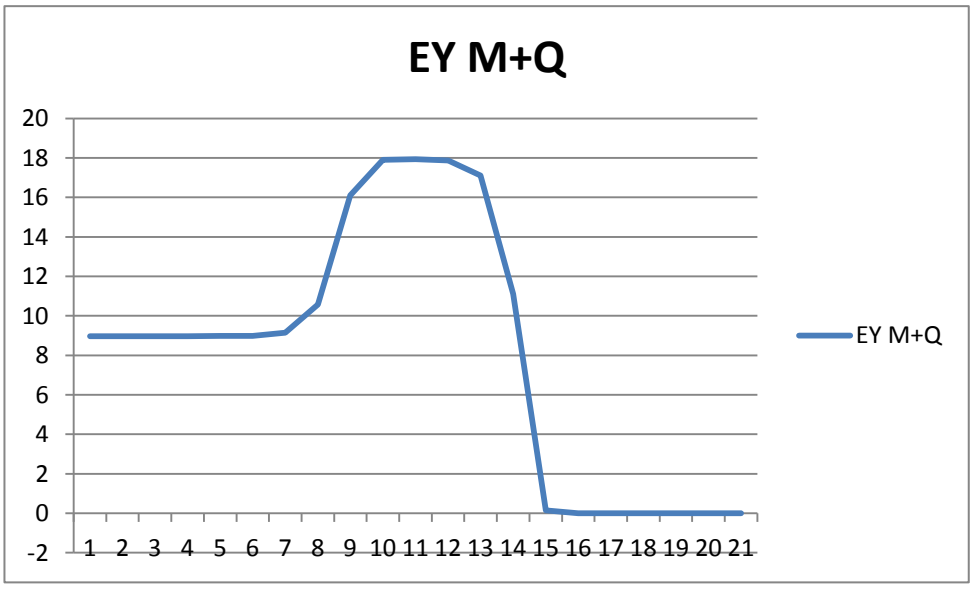
p+ p+ loops, M, Q =1.s,q=q/6 DDA 1 - 10^19







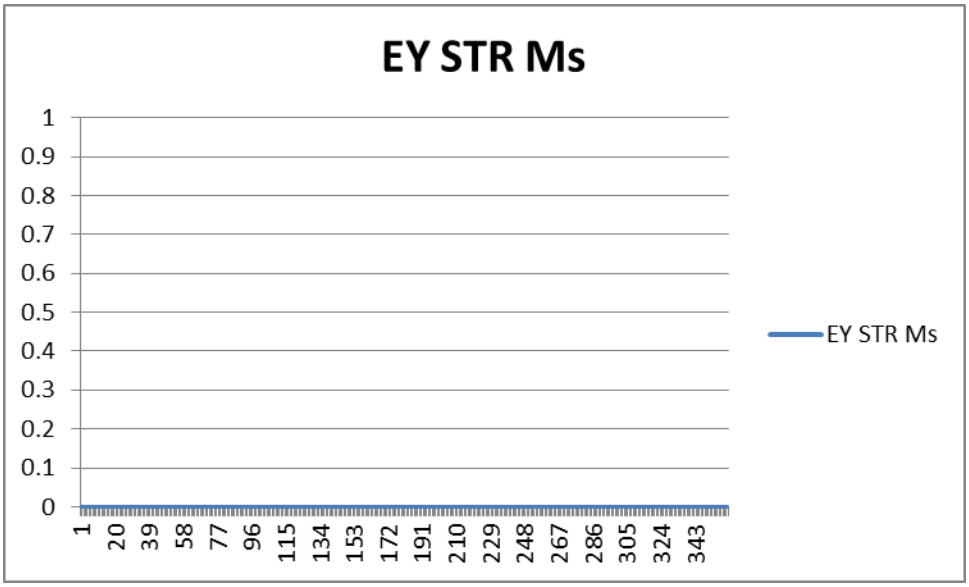

EY STR Qq
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21
-1.5E-18
EY STR Qq

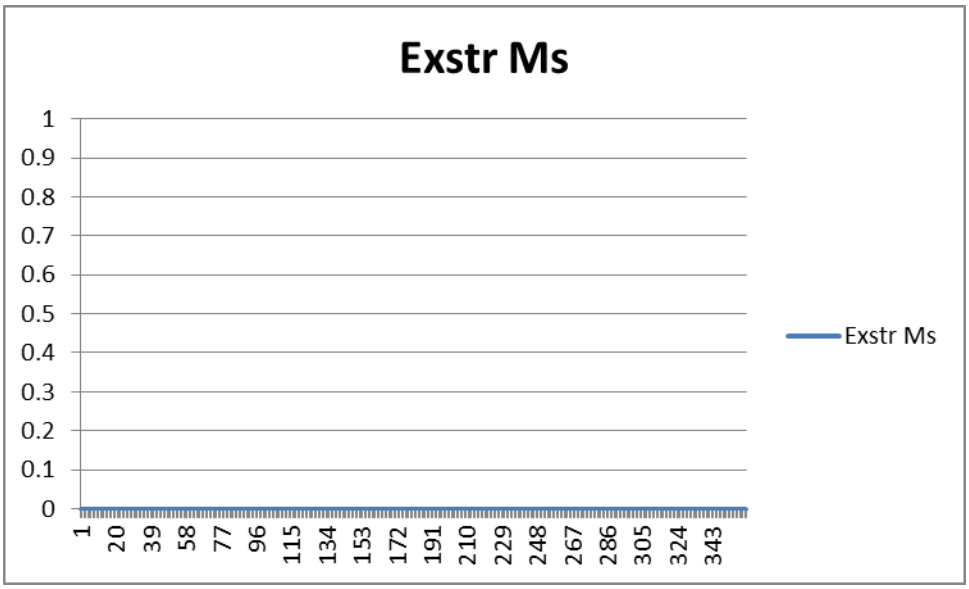

EY M+Q
20
18
16
14
12
10
8
6
4
2
0
-2
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21
EY M+Q

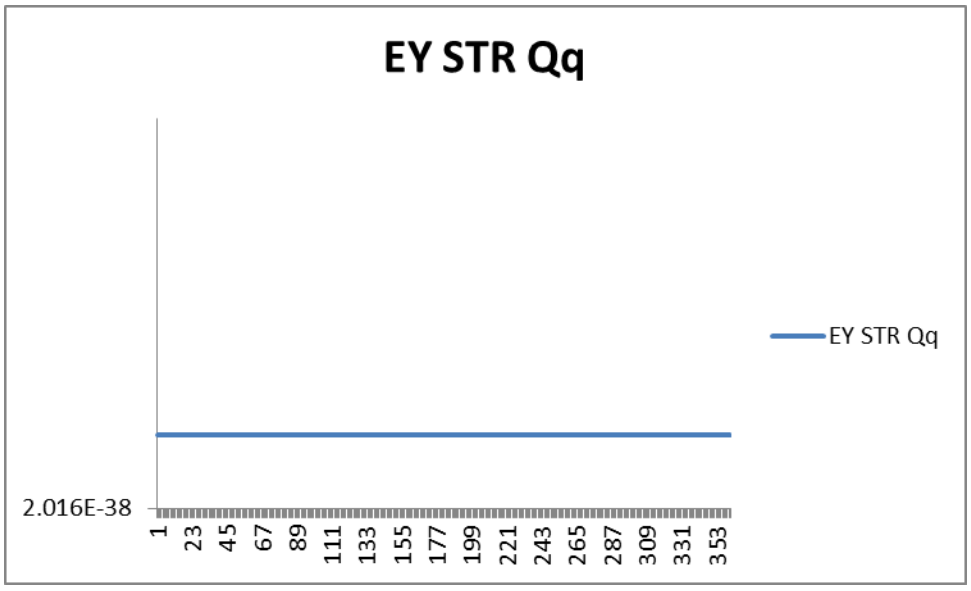
same

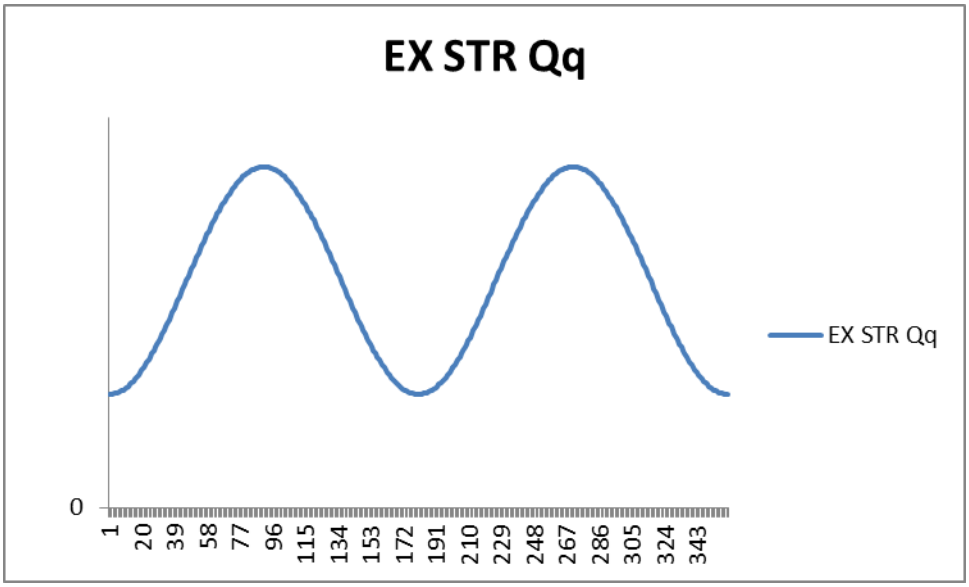
p+ p+ DDA 2.4 10^17 rot id=10^16

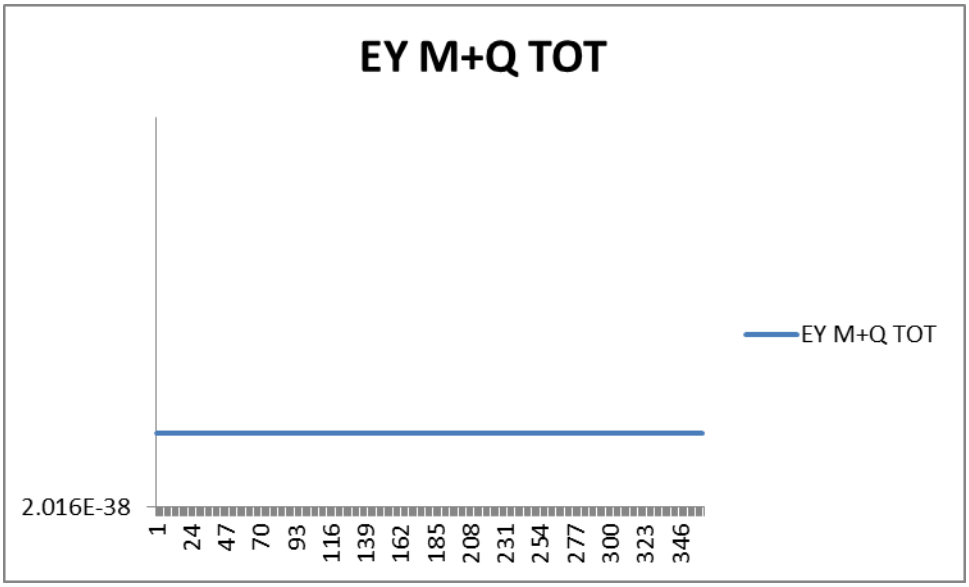
offset 30o w1=w2 k=2x10^-13



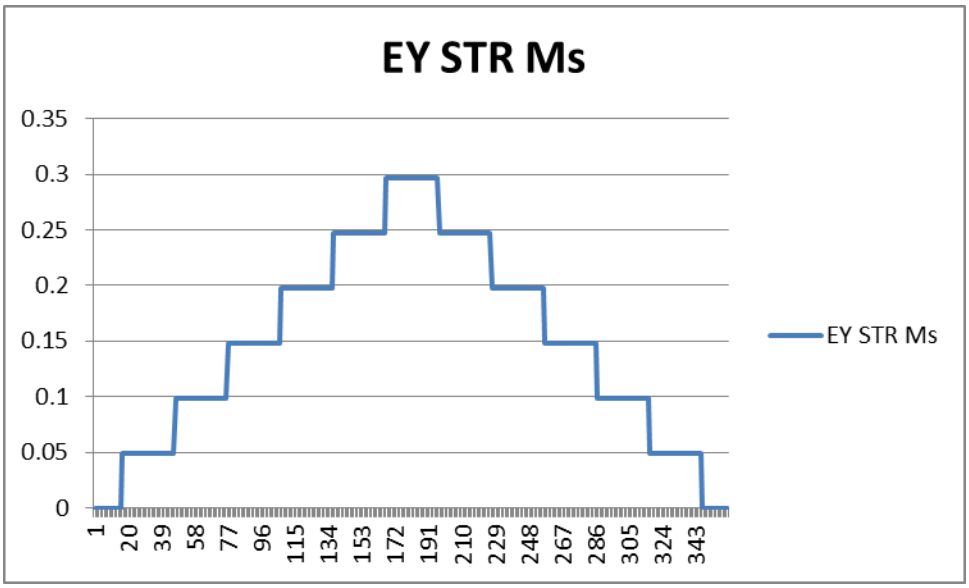


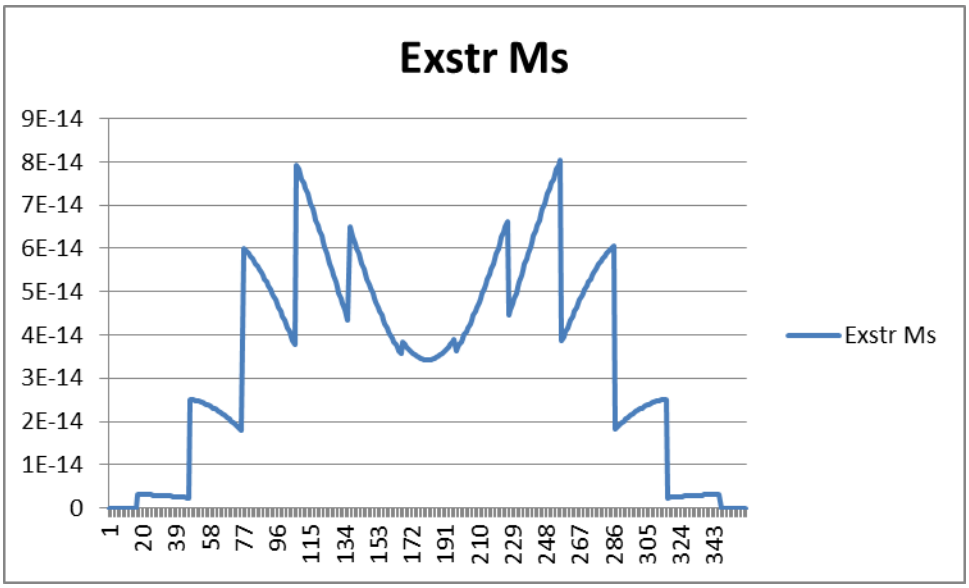


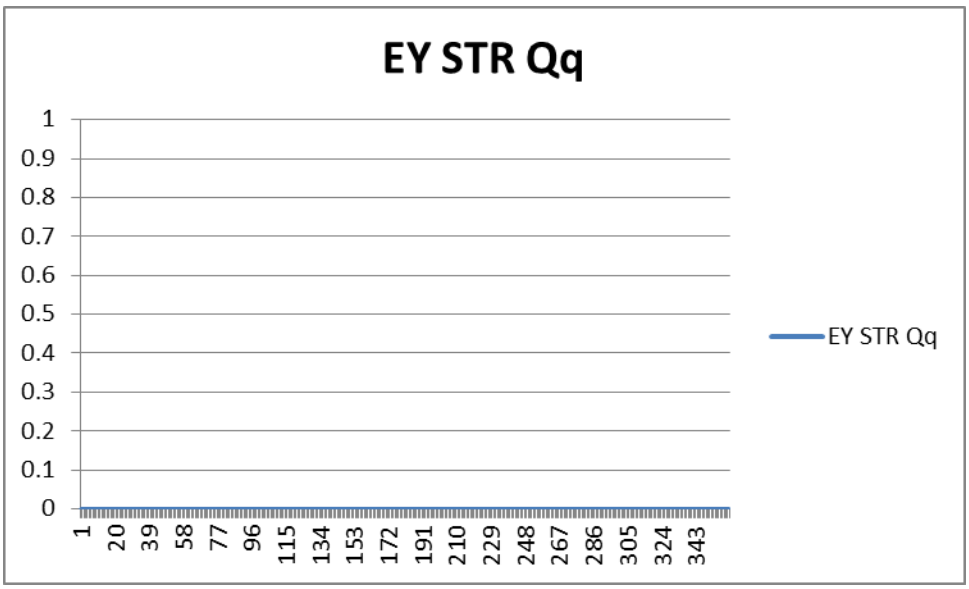

EX STR Qq
0
1
20
39
58
77
96
115
134
153
172
191
210
229
248
267
286
305
324
343
EX STR Qq

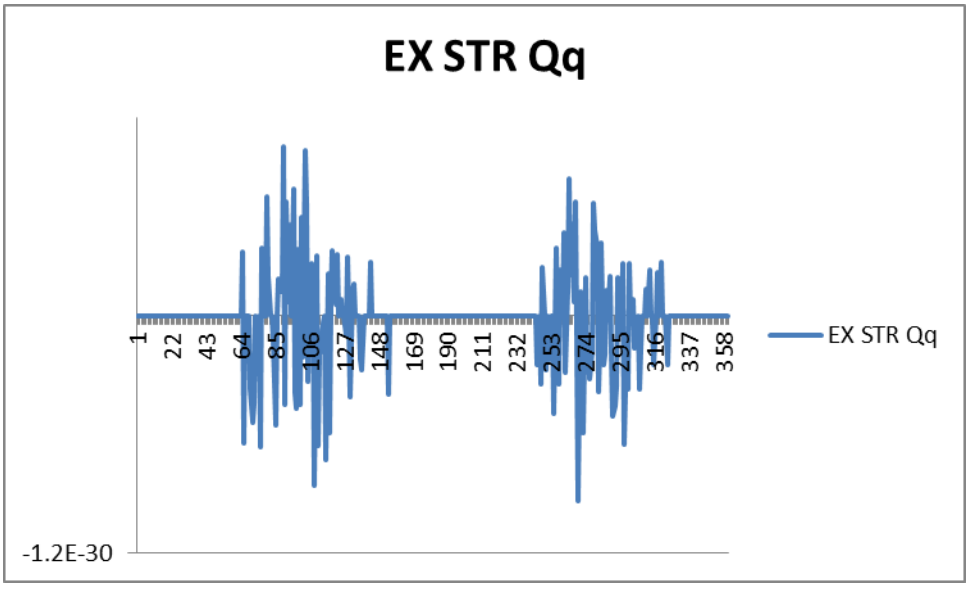

EY M+Q TOT
2.016E-38
1
24
47
70
93
116
139
162
185
208
231
254
277
300
323
346
EY M+Q TOT

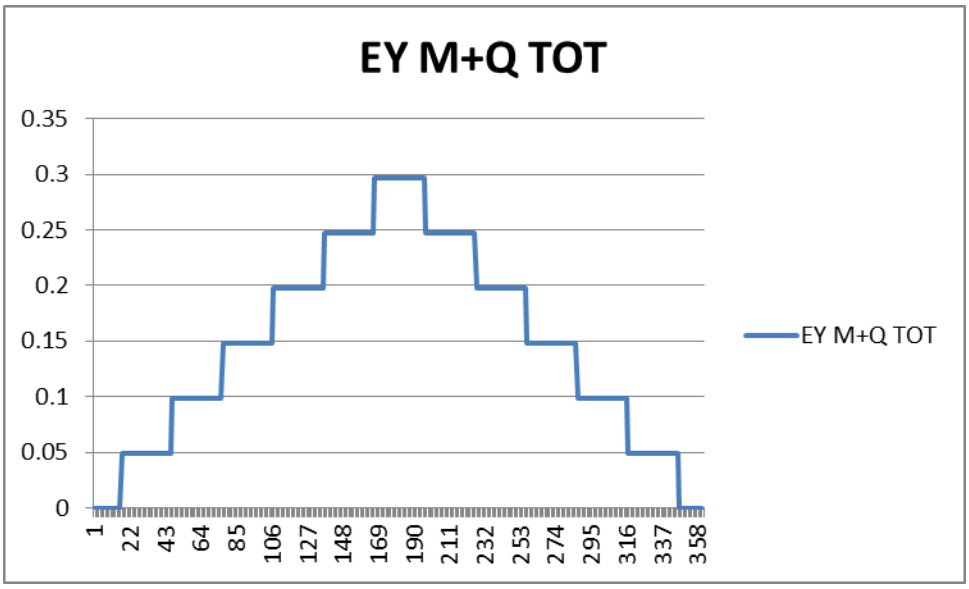
p+ p+ DDA 2.4 10^13 same rot id=10^19
offset 30o w1=w2 k=2x10^-13



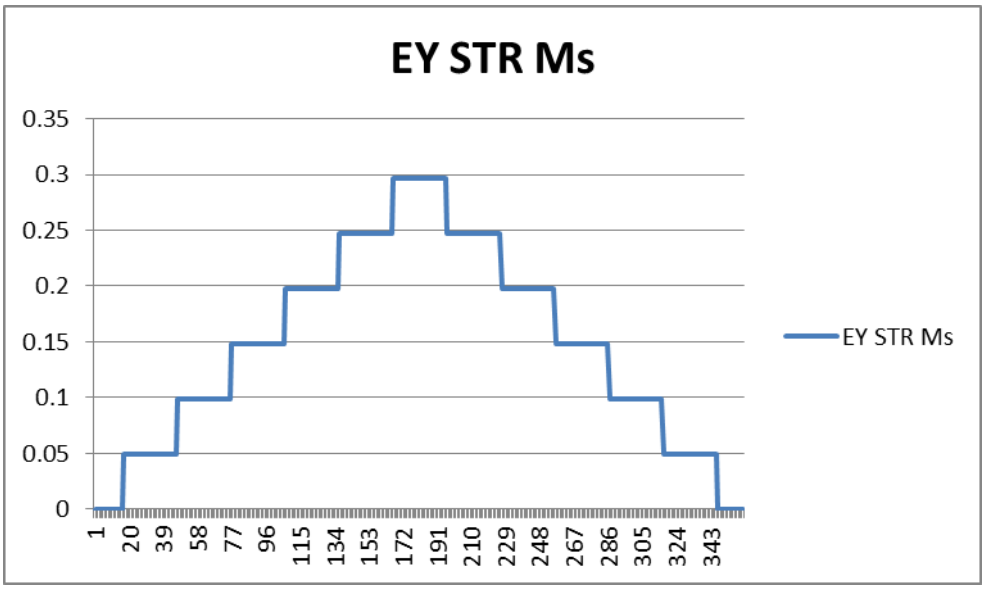


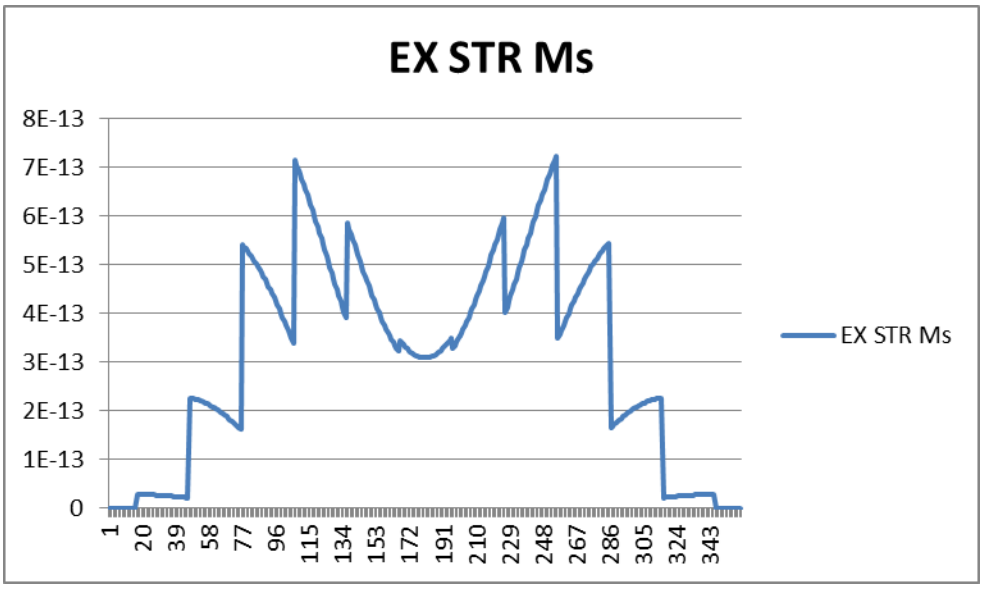


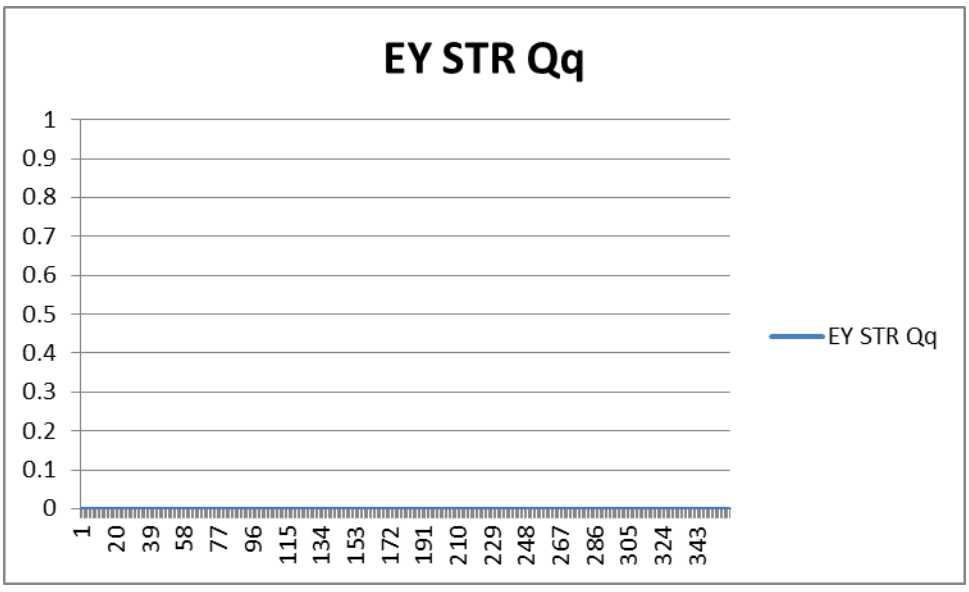

EX STR Qq
1
22
43
64
85
106
127
148
169
190
211
232
253
274
295
316
337
358
EX STR Qq
-1.2E-30

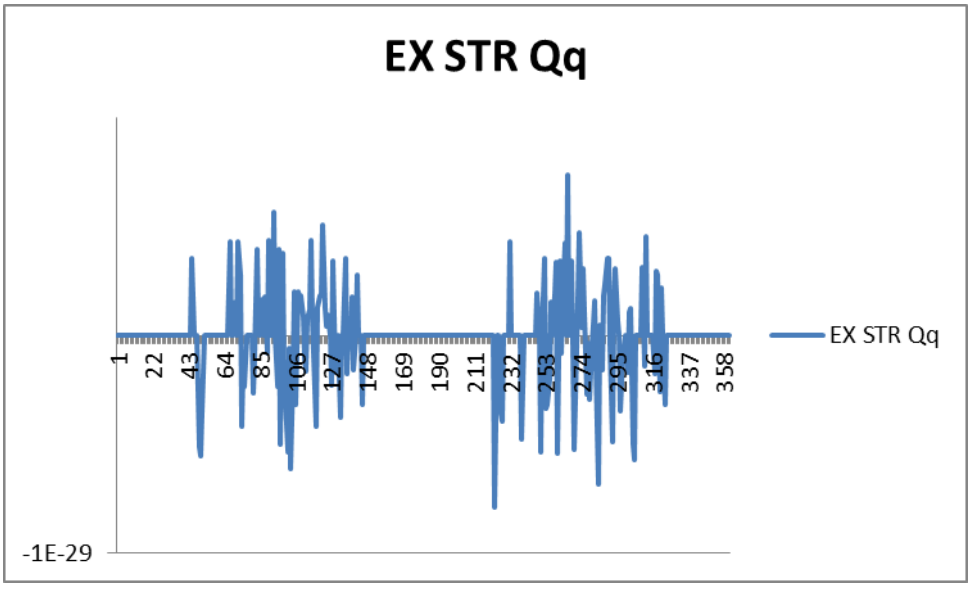

EY M+Q TOT
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
1
22
43
64
85
106
127
148
169
190
211
232
253
274
295
316
337
358
EY M+Q TOT

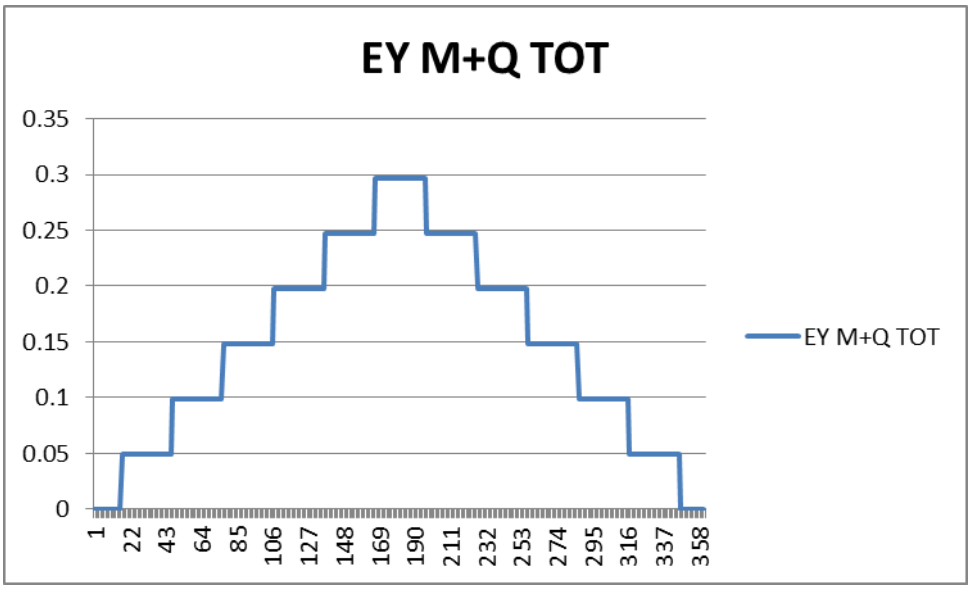
u+ d-DDA 2.4 10^13 same rot id=10^16
offset 30o w1=w2 k=2x10^-13 m=p/9







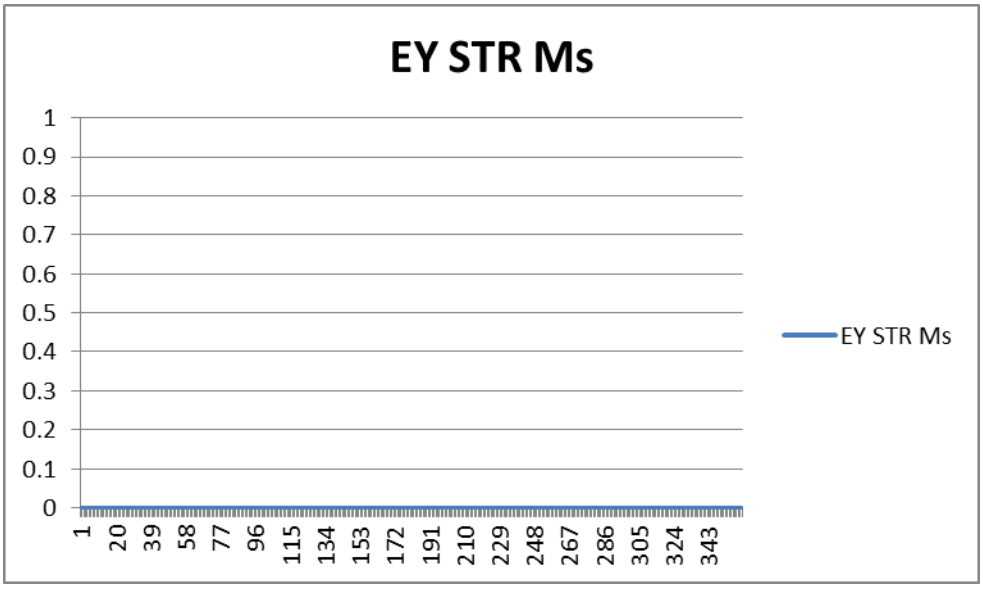

EX STR Qq
-1E-29
1
22
43
64
85
106
127
148
169
190
211
232
253
274
295
316
337
358
EX STR Qq

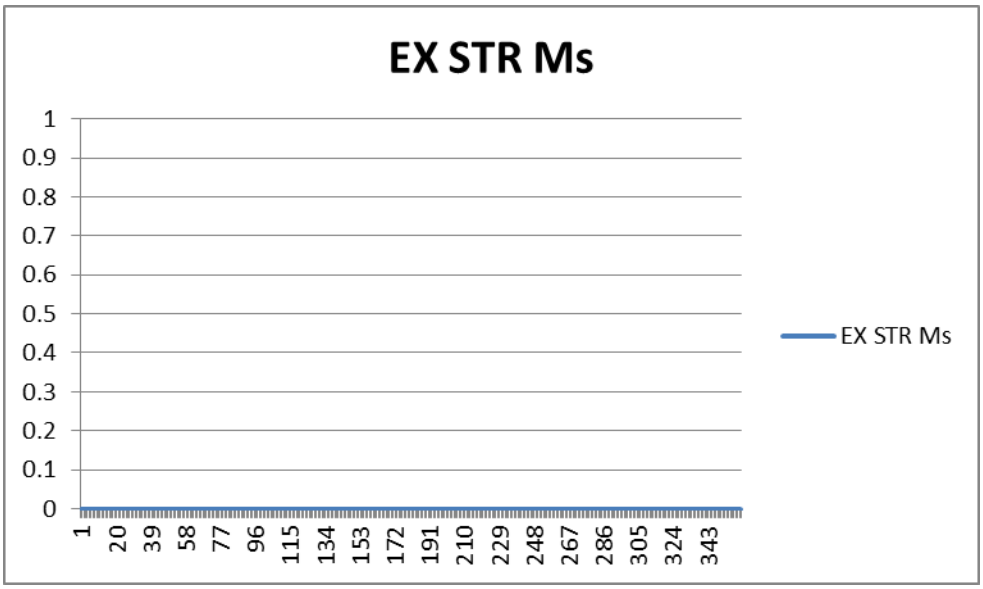

EY M+Q TOT
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
1
22
43
64
85
106
127
148
169
190
211
232
253
274
295
316
337
358
EY M+Q TOT

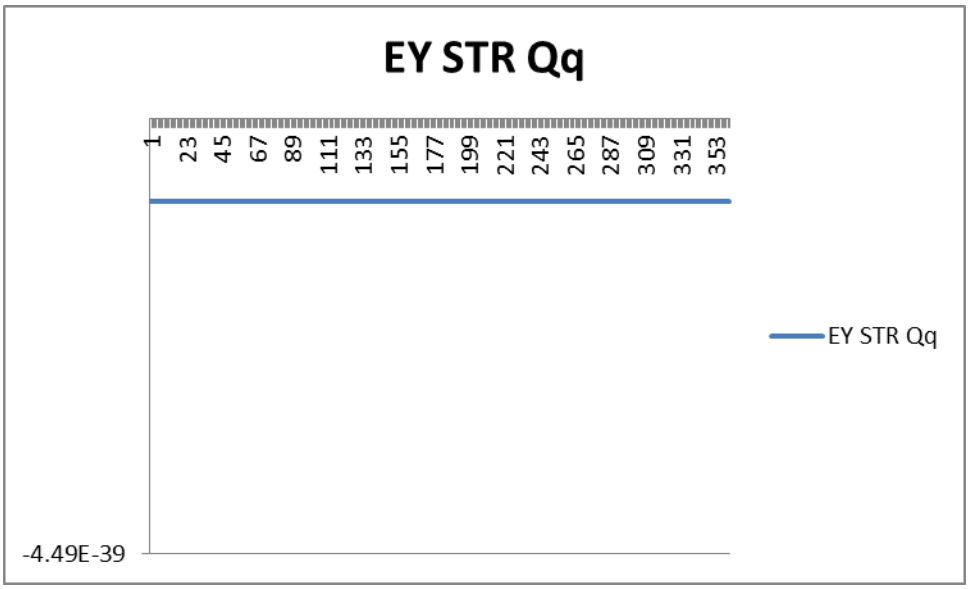
same

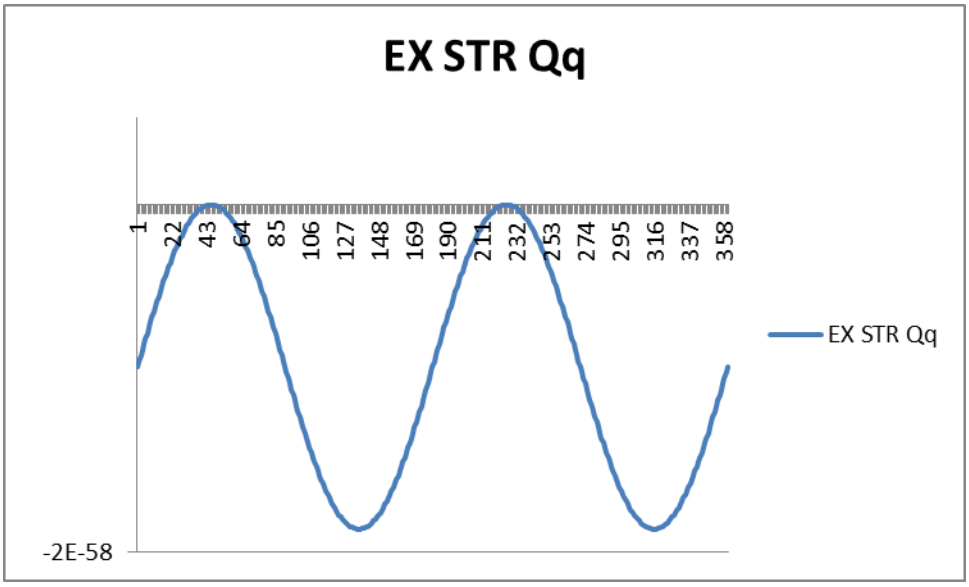
u+ d-DDA 2.4 10^17 rot id=10^16

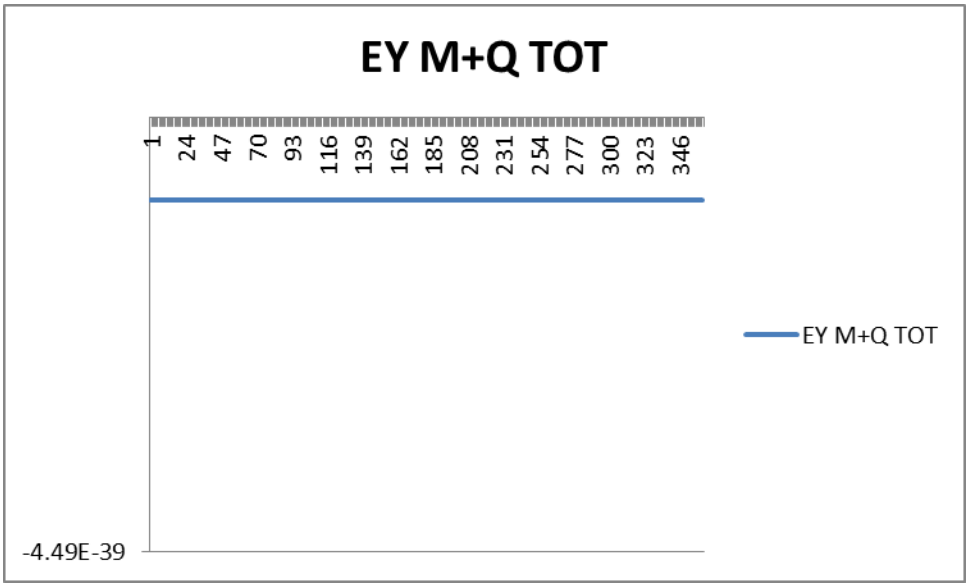
offset 30o w1=w2 k=2x10^-13 m=p/9








EX STR Qq
1
22
43
64
85
106
127
148
169
190
211
232
253
274
295
316
337
358
-2E-58
EX STR Qq


EY M+Q TOT
1
24
47
70
93
116
139
162
185
208
231
254
277
300
323
346
-4.49E-39
EY M+Q TOT