|  |  |  |
| --- | --- | --- |
|  | Our Math | Their Math |
| The set up | In our calculations we are using steel spheres for the magnets and shaped rods for nonmagnetic metal for spacers. | in their they are using one magnet ball and the rest are steel spheres |
| Magnetic dipole |  |  |
| Induced Magnetic moment |  |  |
| Maximum force | , |  |
| Potential Energy Equation | - |  |
| Kinetic energy |  |  |
| Maximum Kinetic energy |  |  |
| Symbols | magnetic permeability  Magnetic dipole  magnetic moment  the force between any 2 spheres  Potential Energy  is the sphere radius  is the distance between any 2 spheres  : Inter component spacing  Intra component spacing  Number of components in barrel component  is the Gauss gun length | magnetic permeability  Magnetic dipole  magnetic moment  the force between the magnet and the incoming sphere  Potential Energy  is the sphere radius  is the distance between the magnet and the incoming sphere  Number of balls between the incoming ball and the magnet  Number of balls between the magnet and the ejecting ball. |

Notes:

* In our calculations we are using steel spheres for the magnets (more than one magnet) and shaped rods for nonmagnetic metal for spacers, while they have only one magnet and the rest balls are nonmagnetic
* their paper says if the distance increased between the magnet and the deliverable, the kinetic energy increases while in our calculations the distance in the deliverable needs to be as small as possible to get higher Kinetic energy
* Their paper says if the distance between the incoming ball and the magnet decreases then the kinetic energy increases and we are doing the opposite
* There is no restrictions in their work while we have two restrictions, the Length and width of the Gauss gun.