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**Magnetic Tractor**

**William C. Brown**

*Colorado State University Pueblo, 2200 Bonforte Blvd Pueblo, Co 81001-4901  
719 242 4969, [william.brown@csupueblo.edu](mailto:william.brown@csupueblo.edu)*

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**ABSTRACT**

The possibility of an asteroid striking the earth is well known. The chosen technique for diverting such an asteroid depends on the lead time measured from the determination that an asteroid has a large probability of colliding and the expected time of such a collision. There are a large number of possible deflection techniques that are available, each suited to different lead times. If the lead time is unpleasantly short, desperation measures such as using nuclear devices may apply. If the lead time is comfortably long, the heralded gravity tractor (GT) is a good option. It is capable of precisely and verifiably altering the orbit of a threatening asteroid. If the lead time happens to be somewhere between desperate and comfortable, it is not clear what option may be invoked. It is likely the most probable scenario to occur is one where the lead time is somewhere in between very short and very long. There is a plethora of different techniques in the literature, but some are so fanciful that their reliability would certainly be in question. There is a need for a new deflection technique that has the reliability and the precision of the gravity tractor but is able to produce larger deflection forces to handle much shorter lead times. This is the problem that this paper addresses. The proposed solution to this problem is a push-pull asteroid magnetic tractor(MT) that is shown to produce orders of magnitudes larger deflection forces and to accommodate much shorter lead times than the GT.

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