



SDI Review Form 1.6

PART 1:

Journal Name:	<u>British Journal of Mathematics & Computer Science</u>
Manuscript Number:	MS: 2013_BJMCS_3400
Title of the Manuscript:	Are Near Earth Objects the Key to Optimization Theory?

General guideline for Peer Review process is available in this link:

(<http://www.sciencedomain.org/page.php?id=sdi-general-editorial-policy#Peer-Review-Guideline>)

- This form has total 9 parts. Kindly note that you should use all the parts of this review form.



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PART 2: Review Comments

	Reviewer's comment	Author's comment (if agreed with reviewer, correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)
<u>Compulsory</u> REVISION comments	I do not agree with the author's statement that "it is difficult to imagine that their ' [i.e., of figure 3.a and 3.b] ' similarity is accidental"; the only relation is the chaotic behaviour of multi-body gravitational dynamics and of CFO particles, but I do not think that this relation has an actual relevance. The jump in figure 3b is related to a close passages of Aphopis in the vicinity of the Earth (flyby) in 2029, which reduces the distance at the 2036 encounter; changing Apophis orbit before 2029 is much more convenient as the 2029 flyby amplifies the effect on the miss distance; the final rise (close to 2036) in figure 3b is instead related to the fact that the deviation effect on the miss distance grows with time (this explains also the non-horizontal plateaus of fig 3.b) and the later the asteroid orbit is changed, the larger is the deflection to achieve the required miss distance. Oscillation have instead a deterministic behaviour related to the asteroid period, as deflection is more efficient when applied close to the perihelion. The asteroid "trapping" in earth orbit is fortuitous (and fortunately extremely rare) as the effect of any flyby could be that of changing the asteroid orbit so as future impacts are avoided. With today's data, Apophis will actually miss the earth in 2036 (no trapping) and the following close encounters will be with large miss distances. Fact is that close approaches occur between bodies with intercepting orbits and the synodic period	



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	determines their frequency; I do not see the concepts of orbit and period in CFO; on the other hand gravitational trapping of CFO particles seems not related to periodical close approaches.	
<u>Minor</u> REVISION comments		
<u>Optional/General</u> comments	CFO can be a useful tool for optimization problems. Perhaps, concepts taken from NEO dynamics could be used to improve the algorithm	

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