Hazards associated with asteroid (138175) 2000 EE_{104}: Temporary Earth co-orbital linked to interplanetary field enhancements

M. Connors[1], C. Russell[2], H. Lai[2], and J. Luhmann[3]

[1]Athabasca University Observatories, Athabasca, AB, Canada
[2]University of California Los Angeles, Department of Earth, Planetary and Space Sciences and Institute of Geophysics and Planetary Physics, Los Angeles, CA-90095, USA
[3]Space Sciences Laboratory, University of California, Berkeley, CA, USA

Near-Earth asteroid 138175 (2000 EE104) will soon be temporarily resonant with Earth, but has a much longer residence in an orbit which features a trapping behavior with frequent Earth and Venus encounters. The object has been identified as a possible source of material for Interplanetary Field Enhancements, a magnetic phenomenon in the solar wind inferred to be due to dust arising when material spalled by impactors striking 138175 itself is destroyed by a following collision by one of the many much smaller objects in crossing orbits. Its horseshoe libration will be reversed by a very close encounter with Venus in 2251 CE. We characterize the orbit of this asteroid, model the dispersion of the primary collision products along its path, and discuss the non-gravitational motion of secondary dust in the solar wind. The study of this object is important even though 138175 is not an immediate hazard to Earth because it is accompanied by objects dispersed in a cloud around the orbit of 138175 that are of sufficient size to be hazardous and they cannot be detected until they enter the atmosphere.