AvH6-5, 2010
6th Alexander von Humboldt International Conference

Is Chicxulub a double impact crater?

J. Klokocnik (1) and J. Kostelecky (2)

(1) Academy of Sciences of the Czech Republic, Astronomical Institute, Ondrejov, Czech Republic (jklokocn@asu.cas.cz), (2) Czech TU Prague, CZ

We have surveyed the Earth's surface using gravity anomalies and second-order radial derivatives Trr of the disturbing gravitational potential computed. from the new very detailed and precise gravitational model EGM 08 complete to degree and order 2159 in spherical harmonic expansion (for selected degrees up to 2190). It corresponds to 5 arcmin resolution on the ground. It provides gravity information about the Earth with unprecedented precision, nearly everywhere few miligals and few miliEőtvős. Over most well known impact crater sites on the Earth we found the second-order derivatives (not available directly from ordinary gravity surveys) offered finer discrimination of circular features than the gravity anomalies themselves. We also discovered that some of the sites show evidence of double or multiple craters which will need further ground verification; namely Chicxulub (Yucatan) and Popigai (Russia). Not only Trr but also filtered Trr and Trrr values, together with various statistics, notes from astronomers about double impactors, crater modelling by point mass integration using realistic geological data about the craters as external constraints – all this provides not proof but strong indication that Chicxulub is a double crater. Chicxulub II, a smaller companion of the famous Chicxulub (I), would be located in NE direction from it in a shallow sea.