

THERMAL ANOMALY FORMATION DUE TO IMPACT CRATERING ON EARTH AND PLANETS.

IVANOV, B. A., Institute for Dynamics of Geospheres, Russian Acad. Sci., Moscow, Russia

A large impact crater just after formation is the source of a significant thermal anomaly generated by shock heating and structural uplift of geotherms. The mechanics of large-scale impacts includes several topics which are still under investigation: the style of the transient cavity collapse, displacement of the crustal material at the target site, and, finally, the temperature field below the crater directly after modification of the transient cavity. A realistic modeling of the cooling history should take into account the effects of local convection and/or differentiation of the impact melt. However, before we can address these topics, it is necessary to construct basic models for the whole sequence of events. For that, numerical modeling is used to evaluate (1) shock wave propagation and (2) evolution of the transient cavity. We present numerical modeling of compression, excavation, and modification stages of a large scale impact event taking into account the real structure of the terrestrial crust. The model results allow to discuss the relative size and cooling time for thermal anomalies around large impact craters.