Geophysical Research Abstracts
Vol. 12, EGU2010-5713, 2010
EGU General Assembly 2010

Kuiper belt objects: radionuclide impact on internal structure dynamics

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The process of Kuiper Belt objects (KBO) matter formation and its internal structure evolution is investigate as dependent on the factors affecting the intensity of radiogenic heating sources.
A solid dust aluminosilicate substance of fringe protosolar cloud regions and amorphous ice H2O have been supposed to be the building material of the KBO matter formation.
Radionuclides 26Al, 40K, 232Th, 235U and 238U embedded in solid dust matter particles have been main sources of radiogenic heat for the KBO life time.
A spherically symmetric celestial body was being created as a result of accretion. The body's internal structure was determined by the composition and the properties of the accretion material and the evolution of the structure – by internal thermal processes.
The dependence of the forming body interior composition and structure on the accretion process rate, on the specific gravities of dust matter and amorphous ice as well as on the possible variations of these parameters along the forming body orbit, has been studied.
Parameter variation domains have been determined at which the formed celestial body has its present-day sizes and average density.
The impact of the heat-and-power potentials of radiogenic heat sources on H2O phase transition dynamics in the celestial body matter has been investigated.
The parameter variation domains of these potentials have been found at which there can be formed areas partly or fully filled with H2O of different phase states.
In addition, the dynamic boundaries of areas have been determined where the ice component is presented by amorphous ice or cubic and hexagonal crystal ice.
The parameter domains of celestial body accretion and radiogenic heat processes have been determined where the body evolution may have a catastrophic scenario up to its complete destruction.