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Structure of the accretion disk around a protostar and the planetesimal formation (I)

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”Headean Bioscience” has started the budget year 2014 by Kekenhi: Scientific Research on Priority Areas. A05 Life planet group aims to study the formation process of life planets like the Earth.

We constructed a steady state 1-D model of a protoplanetary disk taking into account of the magneto-rotational instability (MRI) and photo-evaporation by the ionizing radiation from the central stars. We found that a quiescent zone appears in 0.5AU-5AU and sandwiched by inner and outer turbulent regions. The column density of the quiescent zone is one order of magnitude higher than the other part of the disk. Two boundaries of quiescent zone is promising sites of the planetesimal formation site accumulating the solid particles.

When accretion rate decease down to 10^{-8} solar mass per year, the near side of the disk gas will dissipate by the photo-ebvapolation. We will present the research strategy of the A05 Life planet group and major results.

Keywords: protoplanetary disk, planetesimal formation, magnetorotational instability