

The inner edge of habitable zone for terrestrial exoplanets

*Takanori Kodama¹

1. University of Bordeaux

A large number of exoplanets has been detected from 1995. Some of these are expected to be Earth-sized rocky planets, probably with liquid water on their surface. Most of studies for habitable planets assumed planets with a large amount of water on its surface and estimated the climate using one-dimensional climate model. Recently, estimates using three-dimensional climate models have begun. They focus on the spatially non-uniform distribution of water in its atmosphere. However, exoplanets should have a different amount of water from the Earth's ocean.

We have investigated the climate and discussed the habitability for a planet with a small amount of water on its surface. As a result, we found that the habitable zone, in which a planet can maintain liquid water on its surface for a long term, strongly depends on the water distribution on its surface and a planet with a small amount of water on its surface has wider habitable zone than that for a planet with a large amount of water on the planetary surface.

In this presentation, we summarize the climate and the habitability for the terrestrial exo-planet and discuss perspective of habitable planets in the near future.

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