Habitable climate considering the spatially non-uniform distribution of water

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Liquid water is thought to be necessary for the emergence and evolution of life on the surface of planets. The conditions for the stability of surface liquid water on a planet have often been discussed in terms of the habitable zone. The habitable zone is defined as the region around the central star where liquid water is stable on the planetary surface.

On most of the previous studies, they used one-dimensional climate models and estimated the habitable zone assuming water-rich planets, like the Earth. Recently, estimates using three-dimensional climate models have begun. Therefore, they focus on the spatially non-uniform distribution of water. Here, I review estimates of the habitable climate using three-dimensional climate model and discuss the perspective of habitable planets in the near future.

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