

Hot water in a cup - usefulness of analogy

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Torahiko Terada wrote a short essay entitled 'Hot water in a cup' in 1922. In this essay he showed how physical processes seen in a hot water in a cup have similarity to various phenomena observed in the atmosphere such as formation of clouds, density fluctuation, convection and winds. These similarities stem from similarity of the mechanism in a contained fluid subject to gravity. Analogy of the mechanism between the small-scale laboratory models and the large-scale geophysical phenomena is useful to understand the mechanism of the Earth which is too large to observe its global structure. Analog models of the atmospheric and oceanic processes made considerable contributions in advances of geophysical fluid dynamics which has been proposed by applied mathematicians in 1950s.