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Proposing "analogy experiment" as a sub-category of "analog experiment" in earth science

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In the earth and planetary sciences, the term "analog experiment" indicates laboratory experiments that use analog materials to investigate natural processes. Scaled experiments constitute a representative sub-category of analog experiments. They are designed to have the same dominant dimensionless parameter in the same range as the targeted natural processes. Other primary uses of analog experiments are education and outreach. Reproducing similar phenomena in front of the audience is useful in explaining the essence of the complex dynamics of natural processes. However, it is often the case that we do not fully understand the physics of the experimental systems or the targeted natural phenomena. In such cases, especially when the process is complex, it is difficult to guarantee the scaling similarity. When we take such laboratory phenomena as a research subject of earth science, we encounter critical comments about the scaling issue.

Nevertheless, I think it scientifically important to consider questions like follows. What is the mechanism of the experimental phenomena? Why the behaviors of the experiment look similar to the natural phenomena? To what extent the laboratory and the natural systems are similar. To indicate experimental studies to elucidate these questions, I would like to define "analogy experiment" as a new sub-category of analog experiments. Some recent experiments are presented as examples.