Ingredients for a Future Snow Satellite Mission

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ABSTRACT

Recent work by the snow remote sensing community through SnowEx field campaigns and related efforts supported by NASA's Terrestrial Hydrology Program has begun to refine the ingredients for a future global snow satellite mission. While the outlines of the ingredient list are well-known based on other Earth sensing missions, the detailed contents are still being developed. Indeed, the details of the future SnowEx campaigns are still being developed. Yet this is an opportune moment to take stock of what we think we know, what we still need to determine, and how or why we think so, because the plans have not yet been finalized.

While the details of a snow satellite are still not fully clear, requirements are becoming less fuzzy. The lists of possible sensing techniques and algorithm strengths and limitations are becoming more refined for each type of snow. And since no single technique works for all types of snow, lists of existing and planned spaceborne sensors are being collected with an eye toward considering a constellation approach. The science and application utility of these sensors are being examined through formal observation system simulation experiments. Candidate snowpack, land surface, and radiative transfer models are being explored.

We will provide examples from the list of ingredients, identify key remaining questions or gaps, and suggest ways to address them via field measurements and/or modeling studies. By doing so, we hope to stimulate broad discussion in order to refine the list of ingredients and move closer to a snow mission.

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