

The Cryosphere Discuss., community comment CC1  
<https://doi.org/10.5194/tc-2021-74-CC1>, 2021  
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## Reply on AC1 regarding

Joshua King

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Community comment on "Sentinel-1 snow depth retrieval at sub-kilometer resolution over the European Alps" by Hans Lievens et al., The Cryosphere Discuss.,  
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The following comment was brought to my attention and I would like to respond as a community member involved with Ku-band SAR:

'If the 100-m scale is problematic to retrieve snow depth according to the reviewer, what is then the take on novel satellite mission concepts, such as dual-Ku band SAR, that propose resolutions up to 500 m?'

The Terrestrial Snow Mass Mission (TSMM; a proposed dual-Ku band SAR) in Phase 0 identified the need for higher resolution sensing in Alpine environments. A 50-m mode was proposed, trading swath width for improved resolution where canopy closure was high, or topography was complex. Course resolution 250 and 500-m modes were reserved for lower-complexity domains, generally exclusive of Alpine watersheds, addressing the need for high temporal revisit in downstream applications. Discussions about resolution will be critical moving forward, but the complexities involved with standard modes of TSMM as applied to Alpine environments have been acknowledged in Phase 0.