C55B-0591 Building Trusted Satellite Passive Microwave Data Sets: New Advancements in Calibrated, Enhanced-Resolution Brightness Temperatures for Cryospheric Applications

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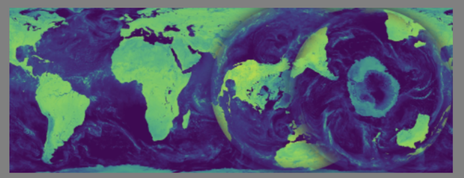
About the CETB Data



Calibrated, Enhanced-Resolution Daily EASE-Grid 2.0 Passive Microwave Brightness Temperatures (CETB) montage of cylindrical and Northern and Southern Hemisphere azimuthal projections.

Collected from passive microwave sensors observing the Earth since 1978, brightness temperatures are used to study

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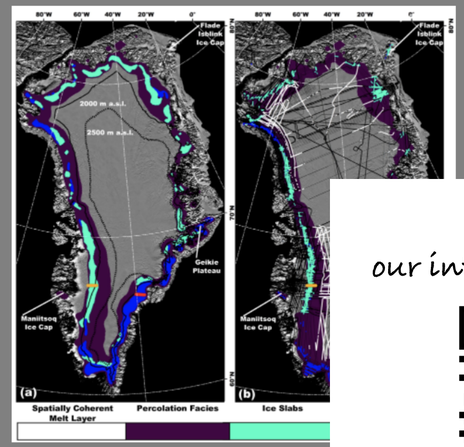
Mapping Ice Sheet Firn Aquifers



Perennial firn aquifer (blue shading), shading), and percolation facies (pu extents (2015-2019) derived from S images, overlaid (left) on the 2015 M of Greenland (MOG) image map (I 2018). SMAP-derived extents are ov with airborne radar-derived perenni ice slab and spatially coherent melt la along OIB flight lines (Miller et al., 2021).

Recent research has demonstrated that perennial firn aquifers and ice slabs significantly affect the mass balance and overall stability of the Greenland Ice Sheet. Until now, maps of these areas have been limited to locations of airborne ice-penetrating radar. Using SMAP CETB enhanced-resolution L-band brightness temperature imagery and an empirical algorithm calibrated

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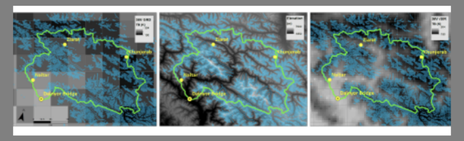
Deriving Melt Onset



Hunza subbasin (green) of Upper Indus, AMSR-E 37 GHz vertically-polarized brightness Bs), 2004 day 164, gridded 5 km (left) compared to image 3.125 km, to enhance spatial Middle image shows elevation n for comparison. Image technique clearly produces riation due to elevation and colder (darker) TBs in higher-

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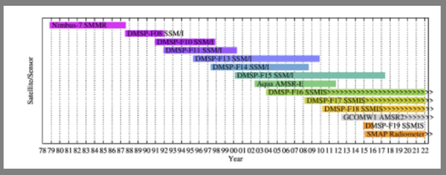
Conclusions & Data Updates



CETB passive microwave sensor timelines. Sensors indicated in color are currently included in CETB (AMSR2 is scheduled to be included in early 2022). Labels ending with ">>" indicate that sensor operation is ongoing, with daily, near real-time CETB processing ongoing.

Enhanced-resolution CETB images are being

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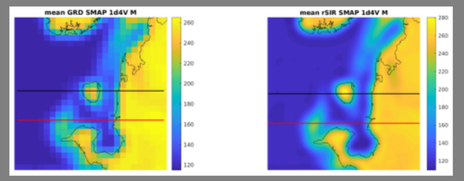
Effective Resolution Enhancement



20-day average of daily SMAP V-pol TB images over the study area spanning day-of-year 91-110, 2015 with a coastline overlay, GRD (25 km, left) and rSIR (3.125 km, right). Note the apparent offset of the island in the GRD, which results from the coarse

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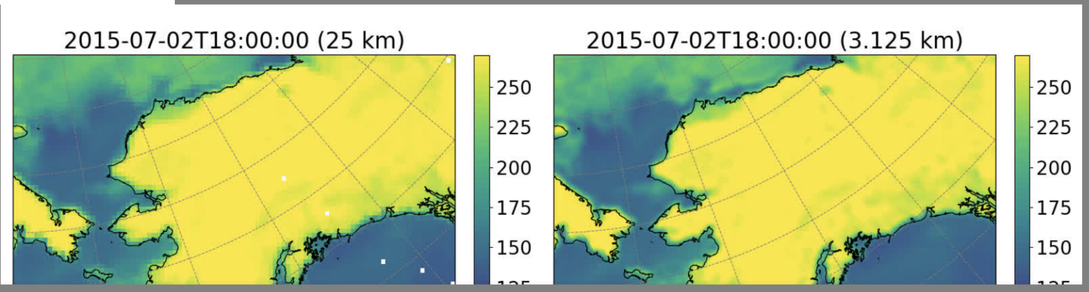

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