Viewing a PIG Under a Spaceborne Microscope

Robert Bindschadler[1], Patricia Vornberger[2], Claire Porter[3] and Paul Morin[3]

[1] NASA (Emeritus) and Morgan State University
[2] SAIC
[3] Polar Geospatial Center

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The Pine Island Glacier (PIG) has been in the scientific spotlight for more than a decade. Inferred from various lines of evidence, the dynamic changes of this glacier are caused by the interaction of the ocean and the ice shelf and the ice shelfôs influence on the glacier. Despite the keen interest in the ice shelf, *in situ* measurements are sparse due to the logistic challenges of getting to and operating in this coastal region. While that may change shortly, most of what we know is derived from satellite and airborne data sets and the resourceful exploitation of these data.

The character of the ice shelf expresses many aspects of this dynamic ocean-ice environment. Recent collections of sub-meter satellite imagery capture exciting details of the surface and provide additional insight into the nature of the ongoing dynamic processes. Most of the ice shelf surface is heavily crevassed, but the detailed view of individual crevasses afforded by this new imagery allows distinct crevasse patterns to be separated so that the likely formation mechanisms for each can be more clearly identified. Detection of crevasses, as well as confidently delineating uncrevassed areas, is a critical precursor to surface field work and a task that is superbly served with this new imagery. The agility of these imaging sensors expands their utility by collecting stereo images that can be used to generate digital elevation models and opening up the third dimension to scientific scrutiny. The examples shown illustrate that surface features of the few-meter scale, such as sastrugi, can be mapped in three-dimensions, giving a more complete description of the surface roughness. Even more promising is the potential for producing sufficiently orthorectified images so that the surface strain field can be mapped at a scale that further reveals the response of the ice shelf to highly variable melt rates at the ice shelf base.