

Abstract 27 – Paper ID: 146**Seasonal Surface Ice Velocity Variability over Polar Record Glacier, East Antarctica Using SAR Data**

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Abstract

The marine terminating glaciers play a vital role to understand the ice dynamics of Antarctic ice sheet, mass balance and its contributing to sea level rise. To track glacier's activity, surface ice velocity (SIV) and strain rate is important, as it indicates basal sliding, deformation and also know about how environment changes. In this study, we used Sentinel-1, 12-days interval GRD HH pol data of Polar Record Glacier from November 2024 to April 2025 (austral summer to early winter). To derive velocity, we used MATLAB-based ImGRAFT (Image Geo Rectification And Feature Tracking) toolbox, which is based on normalized cross correlation method, the displacement tracks between pairs specified with search and template windows. With the help of this high-resolution temporal data, we collectively find seasonal velocity as well as short-term variability. We found minimum velocity near inland area and higher velocity found in north west of glacier's terminus region. The average velocity is around 1.92 m/day and range between ≈ 400 to 1000 m/yr, it shows active discharge. Even though Polar Record is stable glacier but we notice minor fluctuations during this period, it may be because of basal melting, increasing sea surface temperature and decreasing sea ice concentration. Together, these findings show subtle dynamics of Antarctica's one of the marine terminating outlet glaciers, how crucial it is and its behavior. It is important, because it affects on increasing sea level rise.

Keywords: Antarctica, Polar Record Glacier, Surface ice velocity, SAR, ImGRAFT