The Polar Front in Drake Passage: A composite-mean stream-coordinate view

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1) Stream coordinates
We develop a stream-coordinate system based on:
• Core location = latitude of max|\(\Phi|\) along the C-Line
• Angles for projection and rotation calculated from altimetry SSH
• Time periods when PF flows within 20° of perpendicular to C-Line

2) Downstream baroclinic velocity
surface maximum of 0.59 m/s

3) Reference velocity
Differences between the two jets appear in locally influenced deep flow structures

4) Transport
Baroclinic transport is equivalent to the change in Potential Energy Anomaly, \(\chi\), across the PF

5) Mixing and stability
The necessary condition for baroclinic instability is achieved in the bottommost buoyancy layer that intersects bathymetry

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References:
2) Rodrigues, et al. (JGR, 2010). South Atlantic mass transports obtained from surface float and hydrographic data.