

EGU22-5802

<https://doi.org/10.5194/egusphere-egu22-5802>

EGU General Assembly 2022

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Symmetric instability in the surface and deep components of the Atlantic Meridional Overturning Circulation close to the equator

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Models, theory and observations suggest that symmetric instability is excited in the North Brazil Current after it crosses the equator. The instability is fuelled by the advection of waters with anomalous potential vorticity from the Southern to the Northern Hemisphere. There also exists a deep western boundary current which sits below the North Brazil Current. This current advects anomalous potential vorticity across the equator too, and so also becomes symmetrically unstable upon crossing it. Numerical models and scaling arguments will be used to predict the similarities and differences between the action of symmetric instability in the surface and deep currents. We will then explore how the excitement of the instability affects the structure of the deep western boundary current, and how this impacts the development of mesoscale features further downstream.