



A dynamical systems approach to determine the Agulhas Leakage

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The Agulhas Current is the western boundary current of the Indian Ocean. It displays remarkable behavior when approaching the tip of South Africa: instead of turning westward into the South Atlantic, it retroflects back eastward into the Southern Ocean. Through instabilities, large rings are shed by the Agulhas Current that propagate into the Atlantic. The exchange of heat and salt between the Indian and Atlantic Ocean established by the highly variable Agulhas flow is referred to as the Agulhas Leakage. Several methods exist to determine the Agulhas Leakage from model results (and from observations) but quite some discrepancies exist on the resulting values. Here we present a new Lagrangian approach to determine the Agulhas Leakage based on dynamical systems theory. The method is applied to a hierarchy of ocean models (and to observations) and results are compared to those from other methods.