Resumen

The Malvinas Current (MC) plays a key role in regulating the climate of the Earth, as is the unique current that carries subantarctic water properties as far north as 36°S in the southern ocean. Because of such role the MC is often recognized as the *cold route* of the thermocline circulation, a world-wide ocean circulation that redistribute heat and salt around the mains ocean basins. Furthermore, along its path to the North, the MC interacts with the Patagonian shelf-break being the principal actor for sustaining the largest phytoplankton bloom observed in the southern ocean. While sea surface temperature and color satellite images suggest that exchanges between the MC and shelf waters are a recurrent feature, drifter buoys do not. Studying such interactions is vital to help address how much heat and salt is actually transported by the MC to the North and what is they role in the fertilization observed along the Patagonian shelf-break. Here we propose to compute the parabolic transport barriers associated to the MC from satellite altimetry-derived currents and simulated currents generated by high-resolution numerical models. Indeed, recent developments at the interface between fluid dynamics and nonlinear dynamics have led to the unprecedented possibility of detecting from a velocity field realization key material lines (transport barriers) that shape global Lagrangian transport patterns. A number of specific questions that we will seek to answer include: How permeable is the MC? Over what timescale does it behave as a transport barrier? How frequently the shelf is subjected to intrusions/extrusions from/into the open ocean? Where do these exchanges happen more often? What are the mechanisms for these exchanges? Do mesoscale eddies play any role in these exchanges? Is topographic stirring relevant?