EGU21-16071
https://doi.org/10.5194/egusphere-egu21-16071
EGU General Assembly 2021

Island's topography effects on the meso-to-large-scale circulation of the Gulf of Guinea

Dante Napolitano, Gael Alory, Julien Jouanno, Yves Morel, Isabelle Dadou, and Guillaume Morvan
LEGOS, France (dantecn@gmail.com)

In the northeast Gulf of Guinea (GG), São Tomé island marks the beginning of an SW-NE oriented island chain that stretches from near the equator, in the path of the Equatorial Undercurrent (EUC), to the innermost portion of the GG, where its largest island, Bioko, rises at the edge of Cameroon's continental shelf. This region of scarce observations is randomly sampled by surface drifters, which are seldom deployed elsewhere and reach GG carried by eastward equatorial currents. Curiously, the trajectories of these eastward-floating drifters approaching São Tomé veer toward the northeast, ending up in the vicinity of Nigeria, at about 4 °N. Motivated by these trajectories, we investigate the influence of the island chain's topography in the (sub)meso-to-large-scale circulation of the zonal equatorial jets. We ask: (i) does the island chain presents a physical barrier that drives the flow until the inner parts of GG? (ii) are there submeso and mesoscale anomalies generated due to flow-topography interactions?, and (iii) can these anomalies upscale to alter large scale currents, such as the EUC? We analyze the outputs of two NEMO simulations, which differ only by the presence/absence of the islands and their associated rough topography. We run both simulations with 1/12° horizontal resolution, using the same initial conditions. We will show a comparison of both simulations with moored observations (from the PIRATA array), analyzes of particle trajectories in both scenarios (i.e., with and without islands), and the differences in the large-scale equatorial currents depicted from both model runs.