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## Kinetic energy generation in cross-equatorial flow and the Somali Jet

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In response to the north-south pressure gradients set by the annual march of the Sun, a cross-equatorial flow that turns to become a low-level zonal jet at around 10 ° N (also known as Somali jet) is set in the lower troposphere (around 850 hPa) over the Indian ocean. These flows play a fundamental role in the Indian monsoon. A detailed understanding of small and large scale drivers of this flow is lacking. Here we present the analysis of Kinetic Energy (KE) budget of the low level flow using high spatio-temporal resolution ERA5 reanalysis to identify sources and sinks of KE generation. We find that a significant KE generation occurs over East African highlands, Western Ghats and the Arabian sea. Over the oceans, the KE generation occurs mainly due to cross-isobaric meridional winds in the boundary layer. In contrast, over East African highlands and Western ghats KE generation maximizes just above the boundary layer and mainly occurs due to interaction of flow with the orography. We propose a simple model to decompose lower tropospheric KE generation into contributions from surface pressure, orography and free-tropospheric gradients.