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On the Impacts of Different Surface Forcing Regimes for Deep Water Formation in the Mediterranean Sea

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Deep water formation is known to occur at 3 major sites (the Gulf of Lions, Adriatic and Aegean Seas) in the Mediterranean basin. However, the role played by air-sea interaction in setting the frequency and strength of formation events (including major transient episodes such as that experienced in the Aegean sea in the early 1990s) is not well understood. We will explore this relationship using air-sea heat, freshwater and density flux fields, including output from downscaled versions (HIPOCAS and ARPERA) of the NCEP/NCAR and ECMWF reanalyses. The downscaled fields reveal small scale forcing features (including jet-like structures over the dense water formation sites) that are not present in the coarser resolution reanalysis datasets. They also show greater variability in the forcing of the Aegean and the Gulf of Lions than the Adriatic Sea. The differences between the forcing distributions of the Aegean and Adriatic will be discussed in detail and will be advanced as a potential cause for variations in frequency of dense water formation in these two regions.