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Impact of tropical waves on the atmospheric structure and composition above Cabo Verde during the CADDIWA campaign

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The Cabo Verde region is subject to the activity of many tropical waves during the boreal summer. They are known to favour or inhibit convective activity, and to play a role in the formation of Tropical Cyclones. A frequency-wavenumber filtering method is used to identify the different waves. A novel tracking protocol is used to distinguish African Easterly Waves propagating north and south of the African Easterly Jet based on their frequencies within the Mixed-Rossby Gravity - Tropical Disturbance (MRG-TD) domain, labeled MRG-TD1 and MRG-TD2, respectively. Based on in-situ and satellite measurements from the Cloud Atmospheric Dynamics Dust Interactions in West Africa (CADDIWA) campaign which took place in Cape Verde in September 201, the impact of each tropical type on the atmosphere vertical structure and dust content is discussed. Our results show that Equatorial Rossby waves mainly impact thermodynamics above 750 hPa, while MRG-TD1 affect jet-level thermodynamics, and MRG-TD2 modulate moisture in the lower troposphere. Dust event are mainly driven by MRG-TD2. The importance of the interaction between waves for tropical cyclogenesis is also highlighted which provides new outlooks for improving tropical cyclogenesis forecasting in the region.