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Abstract:

Most of the areas in Hawaii have winter wet/summer dry weather patterns. The Kona lee side area of the largest island in the Hawaiian Island chain, the Island of Hawaii, is the only area in the State of Hawaii that exhibits a summer rainfall maximum during the annual cycle. In this study, the historically daily real-time experimental forecasts using the MM5 model during 2004-2009 for major Hawaiian Islands were used to analyze the island scale climate during the seasonal and diurnal cycles. Our results show that the summer rainfall in the Kona area is a combined result of orographic blocking and land-sea thermal contrast. During the summer months, the diurnal heating cycle over the island of Hawaii is more pronounced than any other time of the year. In addition to orographic precipitation on the lower slopes due to the development of afternoon upslope flow, the Kona leeward side has a nocturnal rainfall regime along the coast due to the convergence between offshore flow and the westerly moist reversed flow off