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Disturbance of the Boundary Layer at Summit Station, Greenland by an Atmospheric River

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On 11 July 2012, a rare melt episode occurred at Summit Station Greenland. As described by Neff et al. 2014 (Submitted JGR), a major factor in this melt event was an Atmospheric River (AR), a narrow corridor of high water-vapor content. This AR transited the western Atlantic and theen moved up the west coast of Greenland and thence over Greenland. Back trajectories also indicated significant warm air advection from mid-North America during a major heat wave. We present here the boundary layer changes during this event using sodar to distinguish well-mixed from stable periods and relate these to changes in synoptic forcing and resulting changes in radiative forcing by low-level, shallow, warm clouds. A second near-melt episode also occurred on 29 July which provides an opportunity to compare and contrast boundary layer responses in the two cases.