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Cloud formation over mountain ranges on Titan

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Cassini radar passes have shown a number of mountain ranges on Titan. Radar coverage of approximately one quarter of Titan's surface has located the mountains in mainly equatorial regions with the mean height of mountains sampled across Titan of about 900 m. The flow of air over topographic features can both trigger and enhance cloud formation. Orographically induced clouds near terrestrial mountain ranges include shallow wave clouds produced from upslope flow as well as precipitating stratus and cumulus type clouds. We have explored a number of convective cloud properties using the Titan Regional Atmospheric Modeling System (TRAMS) and now report on clouds formed when a mountain peak is placed within the model domain. In many cases, clouds are seen to form from air rising upslope. Using a range of heights and surface winds compatible with Cassini/Huygens data, we will show constraints on the cases in which clouds can be expected to form. Precipitation is also seen, which could have implications for the eroded appearance of Titan's mountains.