Abstract Submitted
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**Effects of complex terrain on atmospheric flow: dividing streamline observations and quantification**[1] MICHAEL THOMPSON, HARINDRA FERNANDO, University of Notre Dame, SILVANA DI SABATINO, University of Notre Dame; University of Salento, LAURA LEO, University of Notre Dame, UNIVERSITY OF NOTRE DAME TEAM — As part of the MATERHORN field campaign on atmospheric flow in mountainous terrain, the dividing streamline concept for stratified flow over obstacles was investigated using smoke flow visualization and meteorological measurements. At small Froude numbers ($Fr < 1$), a stratified flow approaching a mountain either possesses enough kinetic energy to pass over the summit or else flow around the sides, with dividing streamlines separating the two scenarios. An isolated northwestern peak of the Granite Mountain, approximately $60m$ in height, was used for the study. Incoming flow velocities and temperature profiles were measured upstream using sonic anemometers and thermocouples mounted on a $32m$ tower, while onsite measurements were taken with portable weather stations. Sufficiently strong stratification was developed around 3:00AM GMT, with Froude numbers in the range for dividing streamlines to exist. In the first trial, suitably placed red smoke releases were used and in another trial white smoke was released from a $25m$ crane. In both cases well-defined dividing streamlines were observed and its vertical location was at a height about half of the mountain height, which is consistent with theoretical results based on Shepard's formula.

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