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A Spatial Heterogeneity Parameter for Canopy Flows RYAN SCOTT, HAWWA KADUM, Portland State University, GIULIA SALMASO, MARC CALAF, University of Utah, RAL BAYON CAL, Portland State University — Quantifying spatial structure is an integral component of understanding turbulent canopy flows. Generally, canopies are considered homogeneous rough surfaces through Monin-Obukhov similarity theory which assumes the turbulence introduced by spatial heterogeneity within the canopy blends away in the lower ABL. However, the blending height is a function of canopy geometry as well as atmospheric properties necessitating the use of subgrid turbulence models or semi-empirical relationships. In order to parameterize canopy structure, a novel measure of spatial heterogeneity is proposed from lacunarity analysis where the space filling nature of a given canopy reveals relevant length scales. The parameter provides description of spatial heterogeneity which facilitates comparisons of turbulent quantities between canopies. Further details related to the development of the new parameter will be discussed in presentation along with application of the measure to multiple canopy types of interest to the turbulence community.

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