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Modeling Flow and Turbulence in Forest Canopies BRANDON LITTLE, ARIC MCLANAHAN, STEVE EDBURG, DAVID STOCK, BRIAN LAMB, Washington State University — Control strategies for mountain pine beetles often include releasing trace concentrations of pheromone mimics into the forest canopy. For such a release to be effective for control, diffusivities within the canopy must be known. To compute flow within the canopy, the trees are treated as a porous medium by including sink/source terms in the momentum equations. Trees also affect turbulence within the canopy. With RANS models, sink/source terms can be added to the kinetic energy and dissipation equations to account for this change, but the best form of these added terms is not known. A one-dimensional momentum equation with a k-ε closure was used to study various forms of the sink/source terms for k and ε for a homogeneous forest with a neutrally stable flow. A new form of the sink/source terms that models the turbulent length scales in the canopy best matched the field data

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