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Plant chamber investigations of the formation of new particles in natural VOC mixtures

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Atmospheric oxidation of biogenic emissions forms new particles which can act as cooling agent in the climate system. New particle formation in Boreal regions is related to monoterpene emissions and estimated to contribute a current negative radiative forcing. Biogenic emissions are known to depend on ambient conditions most notably solar radiation and temperature. Here we present results from simulation experiments conducted under atmospherically relevant conditions. The emissions of trees (spruce, pine, birch, beech and oak) were taken as gas phase SOA precursors. The formation of new particles was observed to depend on OH and VOC concentration. Of the tree species investigated oak emissions were observed to lead to the lowest nucleation rates. Possible implications for new particle formation in response to climate change will be discussed.