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Poster Title: Size Distribution and Cloud Condensation Nuclei Activation Ratio of Fabricated Organic Ice Nuclei

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Abstract: Ice Nuclei (IN) created by modifying bacterial, killing the bacterial, and removing the insides so that only the outside shell remains (bacterial ghosts) are termed fabricated organic ice nuclei (OIN). The OIN are atomized and their size distribution and cloud condensation nuclei (CCN) activation ratios are determined during laboratory experiments to determine their effectiveness as immersion ice nuclei. The size distribution is measured using a TSI Scanning Mobility Particle Sizer Spectrometer (SMPS) and a TSI Aerodynamic Particle Sizer. Using a DMT Cloud Condensation Nuclei Counter (CCNC) operated at 0.6 % supersaturation and a TSI Condensation Particle Counter (CPC), the activation ratio is measured which is important to determine their effectiveness of the OIN as an immersion ice nuclei. The OIN have a bi-modal number concentration size spectrum, with one peak at approximate 700 nm, which correspond to unbroken bacterial, and a second peak that is 100 larger between 10 and 100 nm, which likely corresponds to bacterial that have broken apart. While the CCN to CPC (> 10 nm) activation ratio is 0.44, the summation of all aerosols larger than 40 nm approximately equals the CCN concentration at a 0.6 % supersaturation, which is similar to ammonia sulfate aerosol and indicates good potential immersion ice nucleation. Additional laboratory experiments are being conducted to determine the effectiveness of OIN as an immersion ice nuclei and a contact ice nuclei.