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Particle scavenging in a cylindrical ultrasonic standing wave field using levitated drops TYLER MERRELL, J.R. SAYLOR, Clemson University — A cylindrical ultrasonic standing wave field was generated in a tube containing a flow of particles and fog. Both the particles and fog drops were concentrated in the nodes of the standing wave field where they combined and then grew large enough to fall out of the system. In this way particles were scavenged from the system, cleaning the air. While this approach has been attempted using a standing wave field established between disc-shaped transducers, a cylindrical resonator has not been used for this purpose heretofore. The resonator was constructed by bolting three Langevin transducers to an aluminum tube. The benefit of the cylindrical geometry is that the acoustic energy is focused. Furthermore, the residence time of the particle in the field can be increased by increasing the length of the resonator. An additional benefit of this approach is that tubes located downstream of the resonator were acoustically excited, acting as passive resonators that enhanced the scavenging process. The performance of this system on scavenging particles is presented as a function of particle diameter and volumetric flow rate. It is noted that, when operated without particles, the setup can be used to remove drops and shows promise for liquid aerosol retention from systems where these losses can be financially disadvantageous and/or hazardous.

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None

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