Abstract Submitted
for the GEC19 Meeting of
The American Physical Society

Electrostatic enhancement of inlet particle separators for turbine engines[1] SANIL JOHN, DENNIS GIFFORD, JADY STEVENS, Lynntech Inc. — Inlet particle separators only prevent 60-70flow of the turbine engine. Therefore, operation of helicopters in dusty environments can cause significant damage to different sections of the turbine engines due to ingestion of fine dust particles. In this work, electrostatic enhancement of IPS performance was demonstrated for a vaneless IPS design for a standard test dust, without exceeding the limits on intake pressure loss, weight and power. The electrostatic enhancement was achieved by electrostatic enhancement was achieved by electrostatic charging of dust particles using corona discharge and their deflection into the scavenge flow path of the IPS. The dust ingestion tests were initially performed for sub-scale flow (0.6 lb/s) and then scaled-up to achieve full-scale flow (9.5 lb/s) at an engine manufacturer facility. A maximum improvement of 12was achieved in dust separation efficiency by electrostatic enhancement.

[1]This work was supported by the Aviation Applied Technology Directorate under SBIR Contract No. W911W6-15-C-2011.

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Date submitted: 02 Jul 2019 Electronic form version 1.4