University of Colorado Institute for Modeling Plasmas, Atmospheres, and Cosmic Dust (IMPACT; http://impact.colorado.edu) is a large, multi-faceted research program for studies of the effects of high-speed meteoroid impacts. IMPACT facility has been developed to simulate the ablation of micrometeoroids in laboratory conditions. A large (3MV) and small (20kV) electrostatic dust accelerators are used to generate micro- and nano-particles with velocities of 1-100 km/s [1]. While the metallic particles can be accelerated without modification, the various “core” insulating particles need a conductive metal layer coating to be viable in the electrostatic acceleration process. The vacuum vapor deposition process has been developed at IMPACT for synthesis of core-shell particles with low-conductive or insulating ceramic core encapsulated in highly conductive metallic shell layer. Our process is utilizing the metal vapor or sputtering flow of a low-temperature metal vapor plasma in a physical vapor deposition (PVD) process for deposition the metallic shell layer coating over core ceramic particles, as opposed to more common wet-chemical techniques. Because of this, the synthesized core-shell micro- and nanoparticles are free of any chemical surface residues which can potentially improve their micrometeoroid impact simulation efficacy. The dusty plasma laboratory at the IMPACT facility developing a PVD fluidized bed reactor (PVDFBR) utilizing different interchangeable PVD sources of the metal vapor jet for deposition of the shell layer coating over fluidized core particles. These sources include Knudsen cell thermal evaporator, magnetron sputtering and cathodic arc metal vapor plasma source which can be used for generation of the high-speed jet of metal vapor [2,3]. The PVDFBR (Fig.1) is a horizontal rotating reactor in which the core particles to be coated are agitated within a rotating barrel equipped with internal steering/agitation blades. The shell layer coating is deposited by a metal vapor or sputtering flow facing the powder cloud. The particles are subjected to the PVD coating by the condensation of the metal vapor or sputtering flow during free-fall time across the barrel opening. In this work we used Knudsen cell thermal evaporator as a source of the metal vapor jet. The thermal evaporator consists of the polycrystalline BN crucible positioned at θ=10 deg declination to the rotating axes of the reactor’s barrel. The crucible was heated by DC heater consisting of the array of tungsten wires. The evaporation temperature was ranging T_{evap}=1400-1500°C for evaporation of gold, copper and aluminum. For example, the density of the metal vapor flow corresponding to their saturating vapor pressure at 1400°C are: J_d(1400°C) =12.7g/hr; J_{cd}(1400°C)=11.6g/hr. Assuming the temperature of the metal vapor atoms T_{vapor} = T_{evap}, the total mass flow from the vapor jet toward spherical particle with radius r can be written as J_a = \frac{4\pi k_B T_a}{M_a} n_a r^2, where k_B is Boltzmann constant, M_a is a mass of the metal vapor atoms, n_a is atomic density within the metal vapor jet [4]. The dynamic pressure at the surface of the particles generated by this mass atomic flow having the average velocity \sqrt{\frac{4\pi k_B T_a}{M_a}} is capable of containing the particle could inside of the rotating barrel. Copper coated spherical alumina particles were analyzed, sieved for particle size constraints, then readied for use in electrostatic accelerators. Scanning Electron Microscope and Energy dispersive X-ray spectrometer determined particle profile and surface chemical makeup. Follow up testing will determine coating thickness as a function of the processing time duration. Copper coated Alpha alumina particles r=15μm were tested in the 20kV accelerator at IMPACT demonstrating pre-acceleration to ~53 m/s.