**Sheath applied voltage:**

**General Test Case Description:** A collisionless plasma is immersed next to an infinite conductive wall. The wall is negatively charged with respect to the bulk of the plasma. This repels the electrons from reaching the wall. Ions are attracted to the wall and populate the region in front of the wall, which negates the potential drop of the bulk with respect to the wall. A small section of the wall and in front of the wall is simulated.

**Simulation Parameters:**

* **Geometry: 6**0\*5\*5 [λ\_D] (Debye’s lengths = 3.08e-4 [m]) cube.
* **Particles:**
  + Electron inflow at x = 60 [λ\_D]: *nd* = 1e14 [m -3]; *T* = 116000 [K]; *v\_drift* = 0.
  + Ion inflow at x = 60 [λ\_D]: 1H+; *nd* = 1e14 [m -3]; *T* = 200 [K]; *v\_drift* = Bohm velocity = -*√k\_b\*T/m\_p* = -4063.1 [m/s].-30936.4m/s.
* **Chemistry:** None.
* **Background fields:** None.
* **Particle boundary conditions:**
  + Wall x = 0.0: neutralization and electron absorption.
  + Wall x = 60 [λ\_D]: outflow.
* **Electrostatic boundary conditions:**
  + Wall at x = 0: Dirichlet (-20 [V] potential).
  + Wall at x = 60 [λ\_D]: Dirichlet (0 [V] potential).
  + Other side walls: Neumann (0 [V/m] gradient on potential).
* **Time discr.:** *Δt* = 8.86e-11 [s]; Iterations: 70000.
* **Miscellaneous:**
  + **Diagnostic points:** equally spaced in the xy-plane at *z* = 0.

**Post-processing computed results:**

* Plot average of potential and electric field in the xy-plane after obtention of the steady state.

**Obtaining the comparison result:**

Numerical evaluation of the analytical sheath potential, ref.: *Principles of plasma discharges and materials processing*, p168.