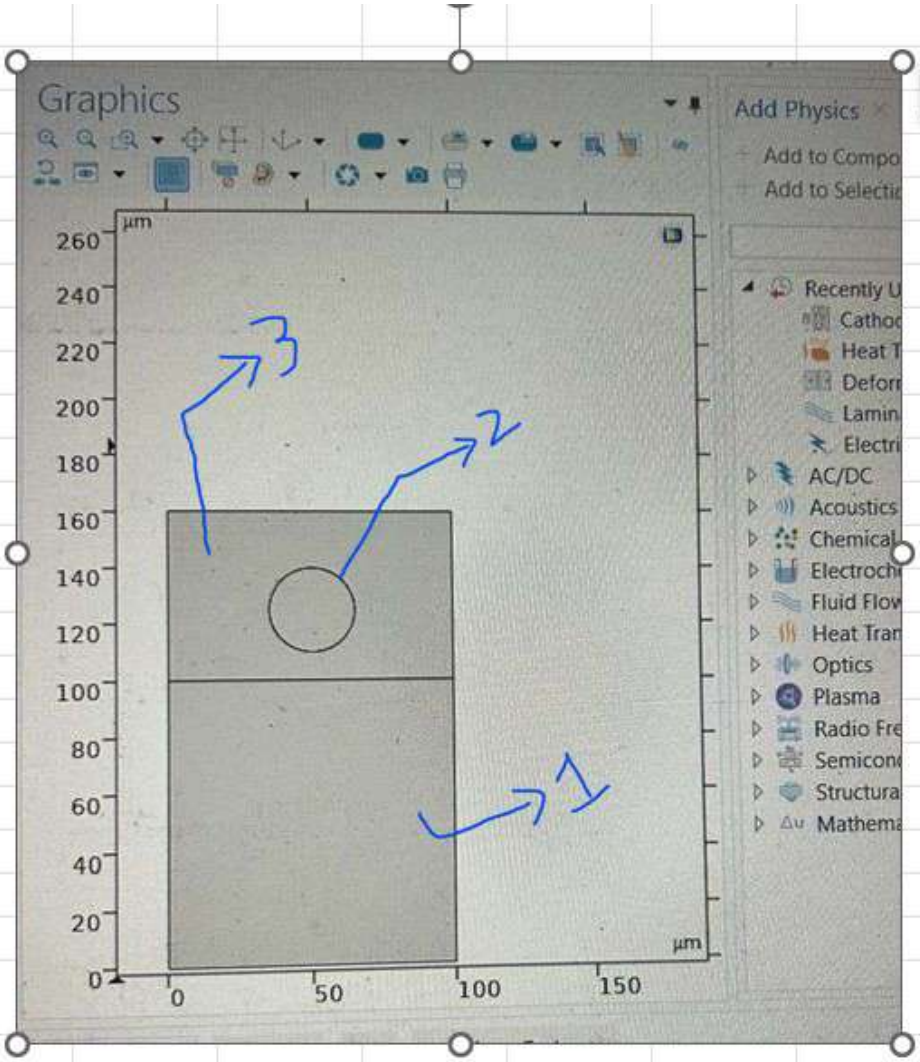
S.no	Geometry description
1	Workpiece (Anode)
2	Wire tool (Cathode)
3	Electrolyte Domain



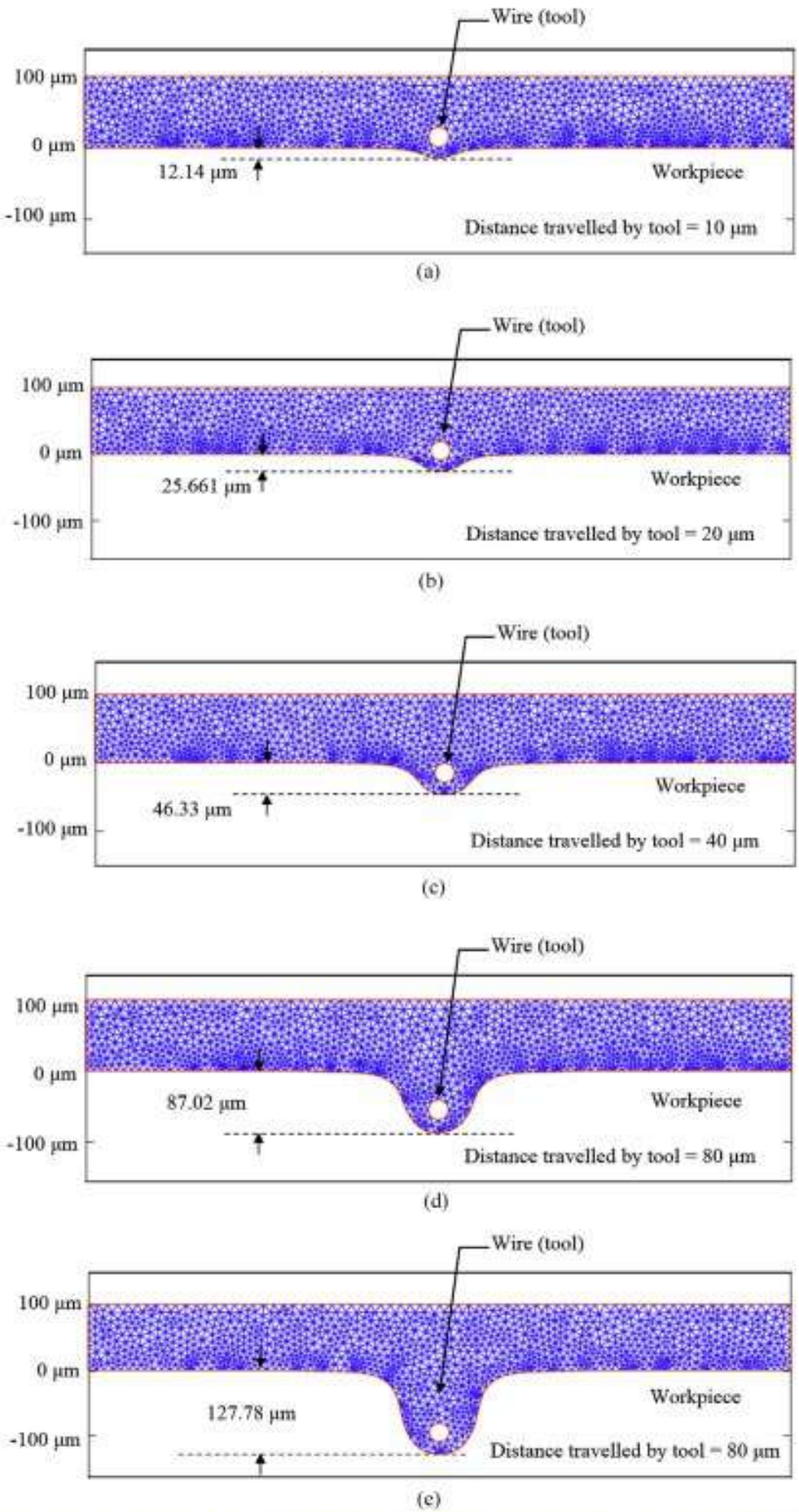


Fig. 6. Simulation images of anode profiles in Wire-ECMM after (a) 2.5 s, (b) 5 s, (c) 10 s, (d) 20 s, and (e) 30 s machining time (Applied potential – 6V, Electrolyte conductivity – 17.1 mS/cm, Tool feed rate – 4 µm/s, Initial interelectrode gap – 10 µm).

Table 1
Range of process parameters used for MATLAB simulations in Wire-ECMM.

S.No.	Parameter	Unit	Range
1	Initial Interelectrode gap	μm	10 (fixed)
2	Wire (tool) feed rate	μm	2–5
3	Applied potential	Volts	6–9
4	Electrolyte conductivity (k) Aqueous $NaNO_3$	mS/cm	17.1 (0.2 mol/L) – 47.5 (0.5 mol/L) (at 25°C)
5	Workpiece material	–	Stainless Steel 304
6	Workpiece thickness	μm	100 (fixed)
7	Wire (tool) material	–	Copper
8	Wire (tool) diameter	μm	30 (fixed)
9	Wire insertion length	μm	600 (fixed)

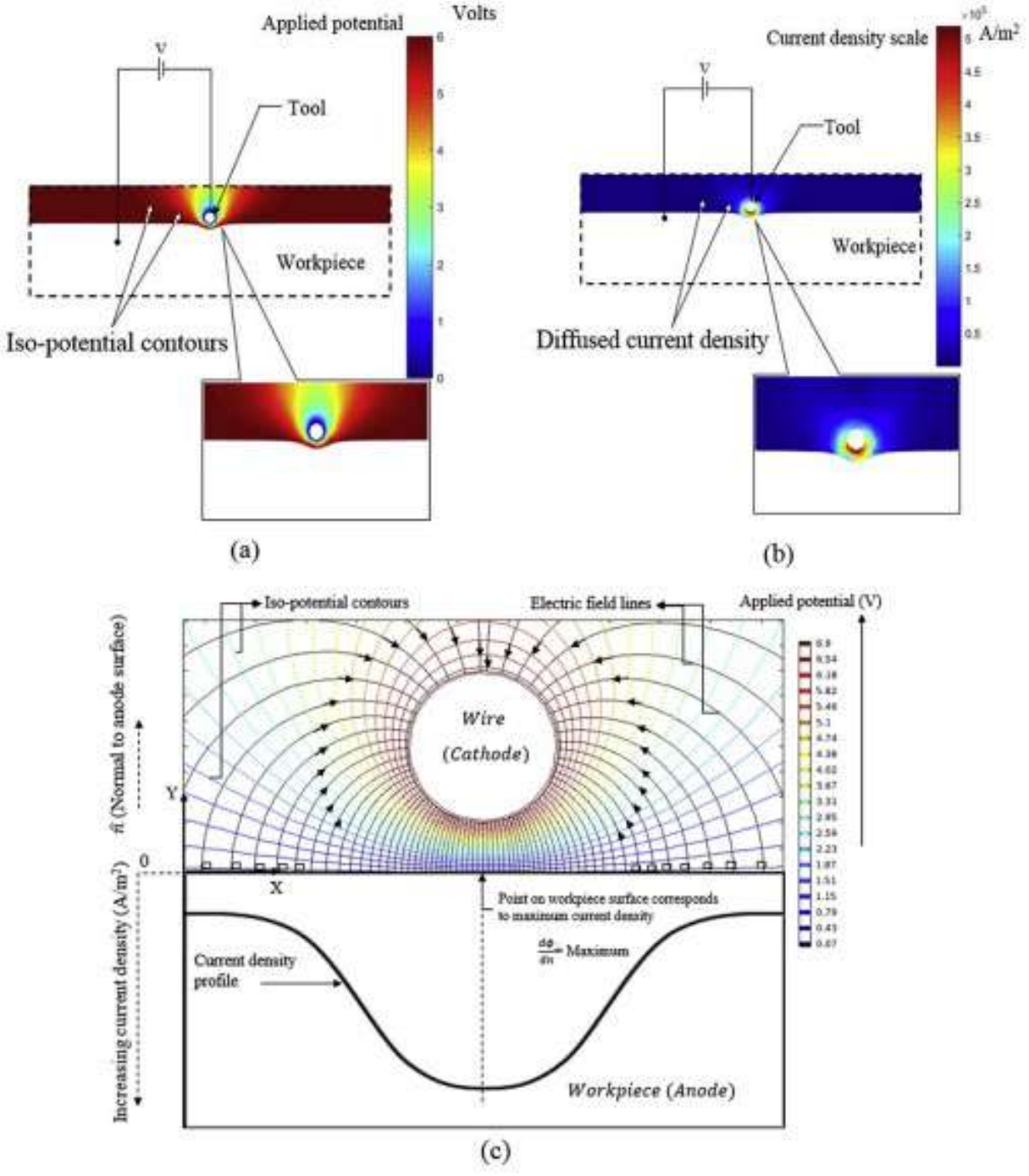
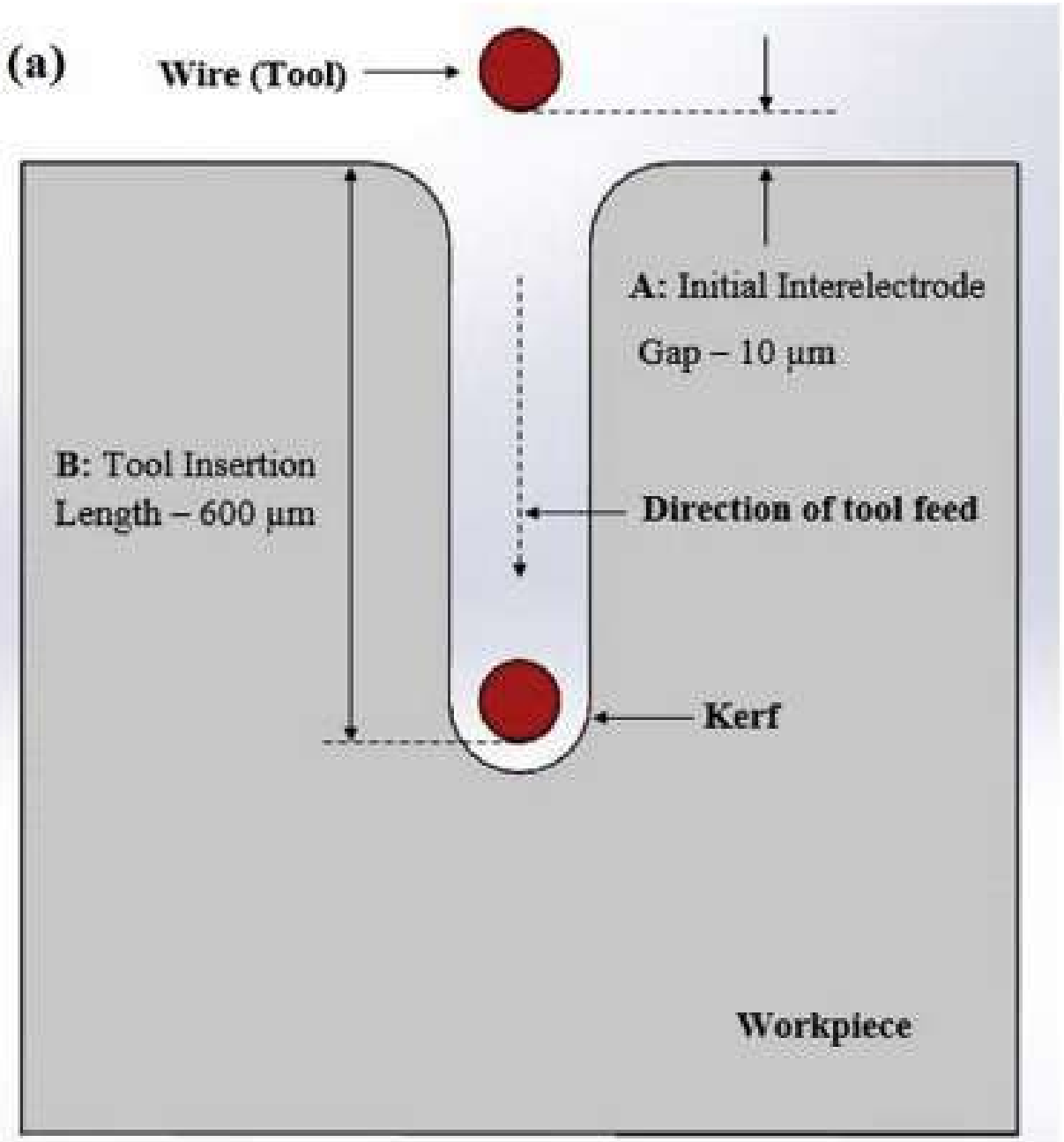


Fig. 4. MATLAB simulation image of (a) Distribution of electric potential showing iso-potential contours (b) Distribution of current density (magnitude) in the machining zone (Applied potential – 6 V, Electrolyte conductivity – 17.1 mS/cm, Tool feed rate – 4 μm/s, Initial interelectrode gap – 50 μm) (c) Construction of electric field lines in simulation domain.



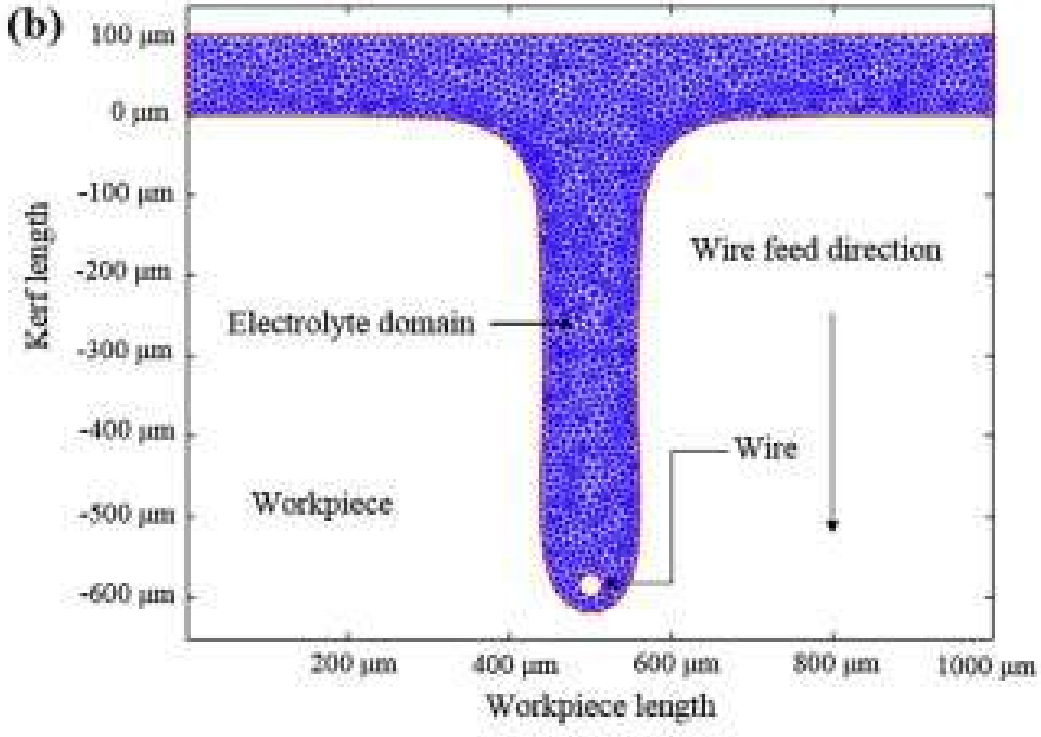


Fig. 3. Schematic image of (a) Machining zone in Wire-EMM (b) Discretization of the simulation zone.

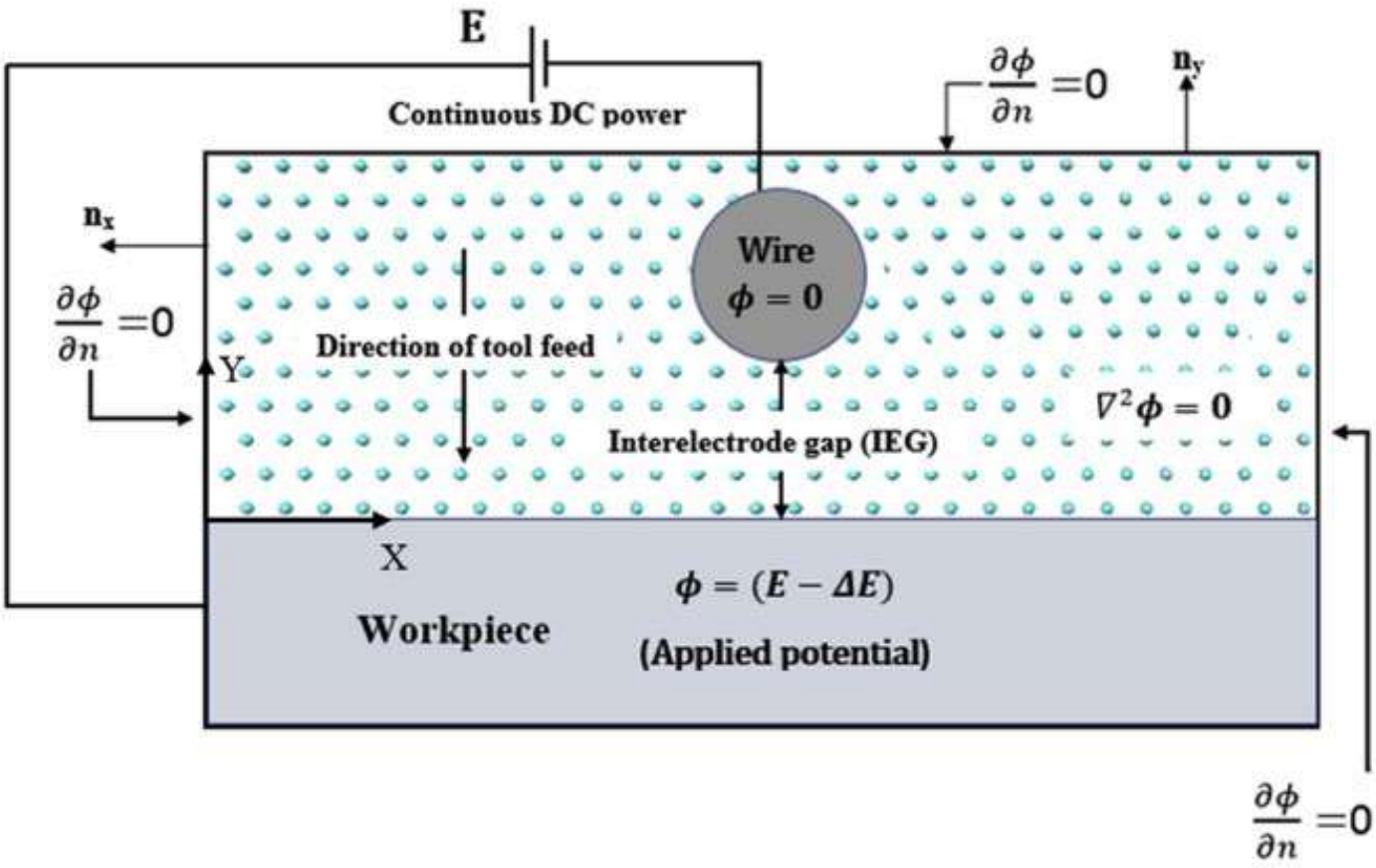


Fig. 1. Schematic diagram of simulation domain of Wire-EMM with different boundary conditions.