

1 Simulation Parameters

1.1 Constants

Pre-defined constats used in Langmuir Model is listed below.

Variable Name	Value	Unit	Description
E_CHARGE	1.602×10^{-19}	C	Elementary Charge
KB	$1.38064852 \times 10^{-23}$	$m^2kgs^{-2}K^{-1}$ or J/K	Boltzmann Constant
AMU	1.661×10^{-27}	kg	Atomic Mass Unit
E_Mass	9.109×10^{-31}	kg	Electron Mass
$EPS0$	8.854×10^{-12}	$m^2kgs^{-2}K^{-1}$ or F/m	Vacuum Permittivity
$MU0$	1.257×10^{-6}	H/m	Vacuum Permeability
$TORR2PA$	133.3	$Pa/Torr$	From Torr to Pa
$J2EV$	6.24210^{18}	eV/J	From J to eV
$EV2J$	1.602×10^{-19}	J/eV	From eV to J
$K2EV$	11600.0	eV/K	From K to eV
$EV2K$	1/11600.0	K/eV	From eV to K
$K2J$	KB	J/K	From K to J
$J2K$	$1/KB$	K/J	From J to K

1.2 Dimensionless Parameters and Naming Rules

Conductivity

aaa:

Variable Name	Type	Unit	Size	Dimensionless	Description
nx	int				Number of Grids in X Axis
nz	int				Number of Grids in Z Axis
$eps[]$	Real	Dimensionless	$nx \times nz$	$\frac{real\ value}{EPS0}$	Relative Dieletric Constant
$press$	Real	$Torr$	1		Pressure
I_coil	Real	A	1		Current
	Species		1		
$positiveIon[]$	Array of Species		Num of Positive Ions		
$negativeIon[]$	Array of Species		Num of Negative Ions		
$neutral[]$	Array of Species		Num of Neutral Species		
nx	int				Number of Grids in X Axis
nz	int				Number of Grids in Z Axis
m_type	string	Dimensionless	1		'EON', 'ION' or 'NEUT'
m_mass	Real	Dimensionless	1	$\frac{real\ value}{AMU}$	Mass in AMU
m_charge	int	Dimensionless	1	$\frac{real\ value}{E_CHARGE}$	Charge in Elementary Charge
$m_density[]$	RealArray1D	m^{-3}	$nx \times nz$	$\frac{m_density}{10^{10}}$ (optional)	Species Desnity
$m_temperature[]$	RealArray1D	eV	$nx \times nz$		Species Temperature
$m_fluxx[]$	RealArray1D	$m^{-2}s^{-1}$	$nx \times nz$		Species Flux in X Axis
$m_fluxz[]$	RealArray1D	$m^{-2}s^{-1}$	$nx \times nz$		Species Flux in Z Axis
$m_divergence[]$	RealArray1D	$m^{-3}s^{-1}$	$nx \times nz$		Flux Term
$m_source[]$	RealArray1D	$m^{-3}s^{-1}$	$nx \times nz$		Source Term