		XPDP1 Baseline	Modified Baseline	
		MCC	MCC	LDA - MCC
Particle-Particle				
$e^- + WG \Rightarrow e^- + WG$	elastic	√	√	
$e^- + WG \Rightarrow e- + WG^*$	excitation	√	√	
$e^- + WG \Rightarrow 2e^- + WG^+$	ionization	√	√	
$WG^+ + WG \Rightarrow WG^+ + WG$	scattering	√	√	
$WG^+ + WG \Rightarrow WG + WG^+$	charge exchange	√	√	
$WG^+ + WG \Rightarrow WG_{fn} + WG^+$	charge exchange		√	
$e^- + T_n \Rightarrow e^- + T_n$	elastic			√
$e^- + T_n \Rightarrow e^- + T^*$	excitation			√
$e^- + T_n \Rightarrow 2e^- + T^+$	ionization			√
$e^- + WG^* \Rightarrow 2e^- + WG^+$	de-excitation			√
$WG^+ + T_n \Rightarrow WG^+ + T_n$	scattering			√
$WG^+ + T_n \Rightarrow WG + T^+$	charge exchange			√
$WG^+ + T_n \Rightarrow WG_{fn} + T^+$	charge exchange			√
$T_n + WG^* \Rightarrow T^+ + WG + e^-$	Penning			Parameter

Table 1 – Particle-Particle Interaction Modification Summary.

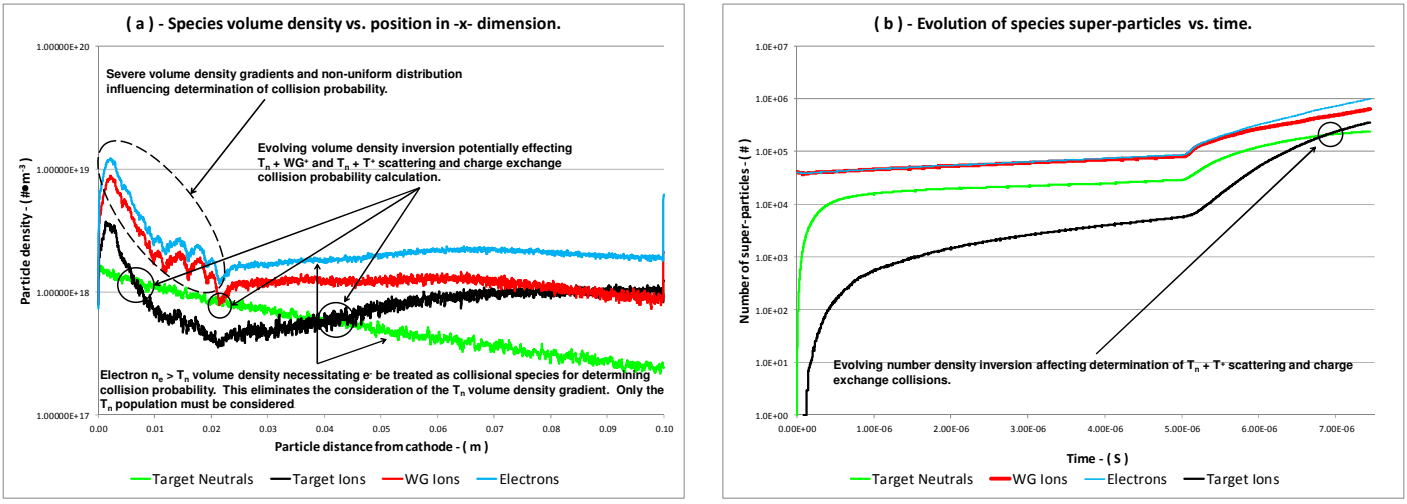

Figure 1 – HiPIMS pulse transient capture demonstrating: (a) - volume density inversion and volume density gradients, (b) - population inversion.

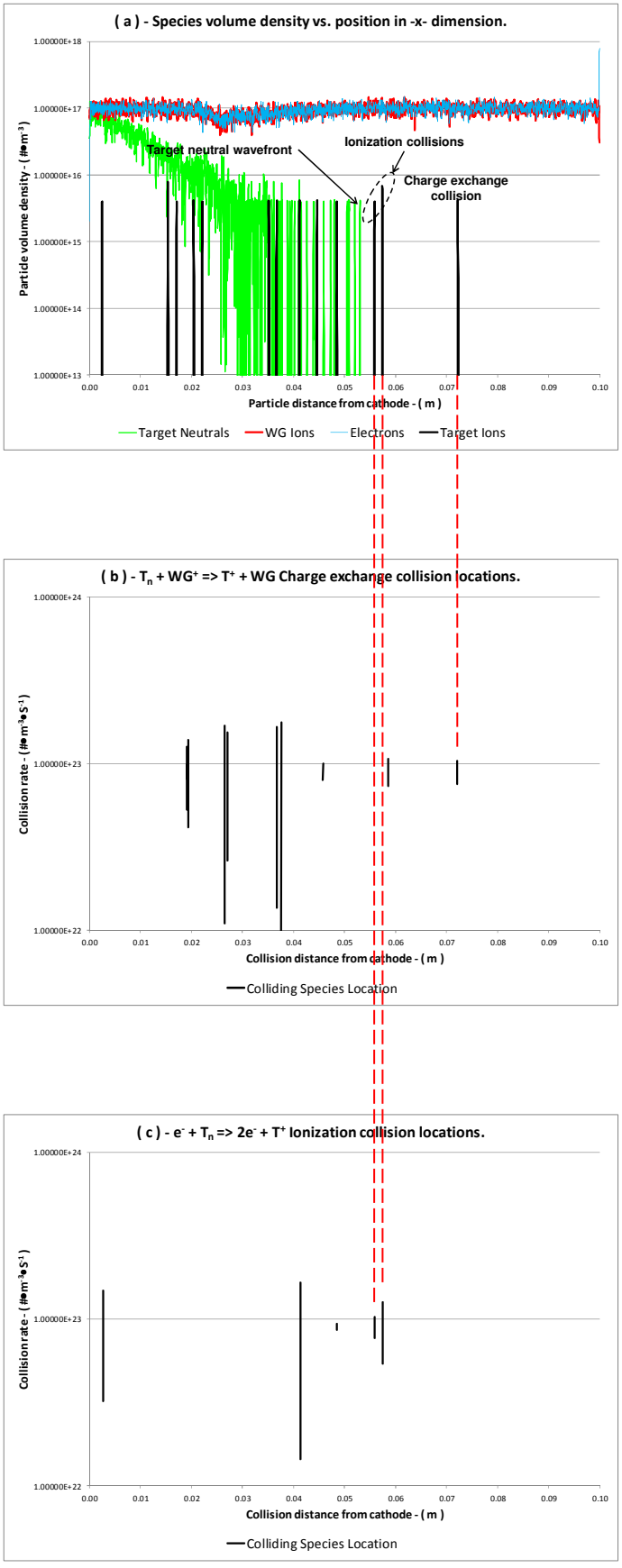

Figure 2 – LDA-MCC disabled: (a) – species volume density during sputtering, (b, c) – charge exchange and ionization contributions to T^+ ions.

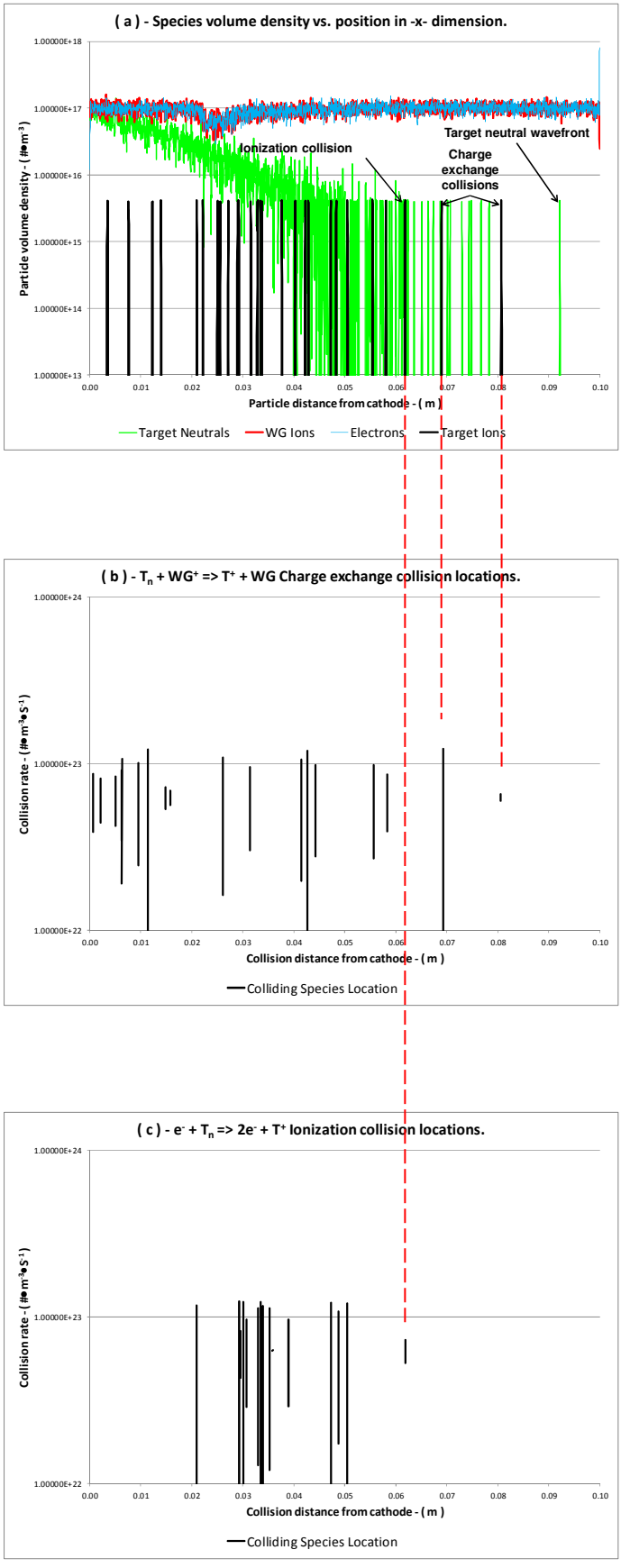

Figure 3 – LDA-MCC enabled: (a) – species volume density during sputtering, (b, c) – charge exchange and ionization contributions to T^+ ions.