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Utilization of Two-Point Model to Estimate Separatrix Temperature in NSTX[1] JOHN RHOADS, Princeton University, RAJESH MAINGI, ORNL — A method of estimating the separatrix temperature was developed using a simple two-point model of the scrape-off layer (SOL). Given an input power, neutral density, and connection length, the two point model determines the target temperature, target density, and upstream temperature. Source and sink terms in the model include radiation and volume recombination in the region near the divertor, collisions with neutrals and viscous forces in the SOL, hydrogen recycling, and parallel heat convection effects. Although the connection length at the separatrix is not well defined, this technique uses a finite connection length determined from the magnetic reconstruction of the discharge at a fixed normalized flux, $\hat{\phi}$, slightly outside of the last closed flux surface. Characteristic connection lengths from the midplane to the outboard lower divertor vary from approximately 8 meters at $\hat{\phi} = 1.01$ to 12 meters at $\hat{\phi} = 1.002$. The upstream temperature from the two-point model is then mapped onto the Thomson scattering profile and the separatrix temperature is deduced from the offset in the normalized flux. Typical separatrix temperatures fall within the range 40-100 eV.

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