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Interchange Reconnection is thought to play an important role in determining the dynamics and material composition of the slow solar wind that originates from near coronal hole boundaries. To explore the implications of this process we use the HYDRAD code to simulate the field-aligned dynamic evolution of a newly formed, post-reconnection flux tube. The initial condition is composed of a piecewise quasi-steady state, in which the regions above and below the reconnection site are extracted from fully-equilibrated solutions along open and closed field lines. The discontinuity at the reconnection site evolves as a Riemann problem and eventually forms a classic N-wave configuration, which propagates out of the domain and into the heliosphere as the system eventually returns to a quasi-steady wind solution. Additionally, the time-dependent non-equilibrium ionization of oxygen is determined in real time and ultimately used to construct in situ diagnostics of the conditions near the reconnection site. This idealized realization of the dynamic evolution of plasma along a post-reconnection open field line provides a baseline for predicting and interpreting the properties of the slow solar wind.

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