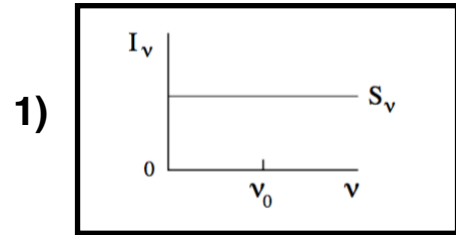


Below are six scenarios for radiative transfer through a intervening medium with depth D . The material has a spectral line centered at ν_0 with an approximately Gaussian line profile $\Phi(\nu)$. Each scenario lists whether the medium is optically thin or thick and if there is any difference in optical depth at line center. Match the Scenario to the Resulting spectrum.

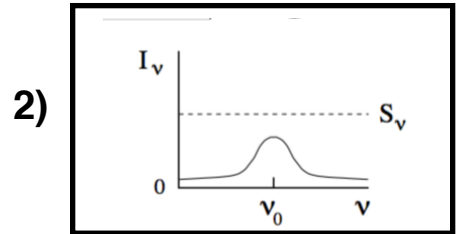
Scenario

Resulting Spectrum

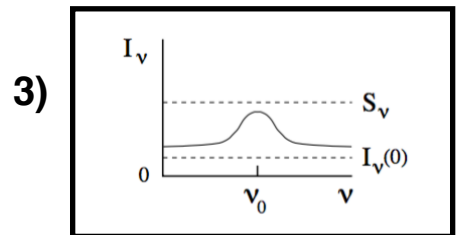
a) $\tau_\nu(D) < 1$
 $\tau_{\nu_0}(D) > 1$
 $I_\nu(0) > S_\nu$



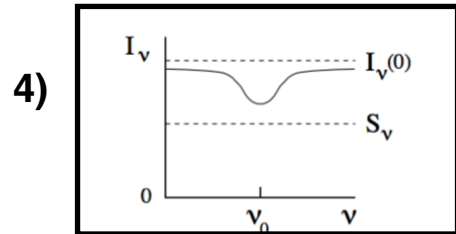
b) $\tau_\nu(D) < 1$
 $I_\nu(0) > S_\nu$



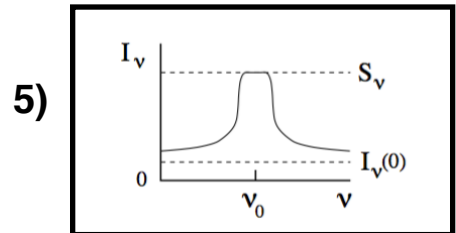
c) $\tau_\nu(D) < 1$
 $I_\nu(0) = 0$



d) $\tau_\nu(D) \gg 1$



e) $\tau_\nu(D) < 1$
 $I_\nu(0) < S_\nu$



f) $\tau_\nu(D) < 1$
 $\tau_{\nu_0}(D) > 1$
 $I_\nu(0) < S_\nu$

