

Figure 3-6

In the top graph, we show the expected fractional changes, as in figure 3-5, but for a magnitude change of 0.5. In the lower graph, we plot the expected change in residual intensity (RI) for optically thin lines, optically moderate lines, and optically thick lines.

The values for the optical depth, τ , refer to the initial epoch 1. Note that $\tau \simeq -\ln[\textit{residual intensity}]$ and $fa \propto \text{column density}$ (see text for conditions and details). Residual intensity is defined as one minus the normalized (continuum-divided) flux. So an increase in residual intensity means that the absorption depth decreased.

For a given change in fractional abundance, optical depths of ~ 1 will yield the most visible changes. High optical depths require rather large fractional abundance changes to show a visible change, and only if the abundance decreases.