

Pan-Spectral Shock Diagnostics I: The Abundance Grid for High Velocity Shocks

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ABSTRACT

We present a fine grid of steady-flow fast shocks and their photoionized precursors with velocities in the range $100 - 1000 \text{ km s}^{-1}$ all computed using the MAPPINGS III code. This grid is computed for four abundance sets; $2\times$ solar, solar, LMC and SMC. The spectra that result include all the atomic continuum processes and line emission between 1\AA and $1000\mu\text{m}$, but do not include dust destruction or re-emission processes. To maximize the utility of these models to the observational community, the shock and precursor spectra are used to predict emission-line fluxes and diagnostic line ratios in the near- and far-IR, optical, UV, and X-ray regimes. We also predict broad-band colors and fluxes in the UV, optical, and near IR range including the Cousins, Sloane and the Hubble ACS and WFC3 filters systems, as well as in the X-ray bands accessible to Einstein, XMM, and Chandra. No attempt is made here to derive broad-band fluxes or colours for ISO or SIRTf.

Subject headings: interstellar: HII, abundances—galaxies: chemical evolution, abundances, starburst