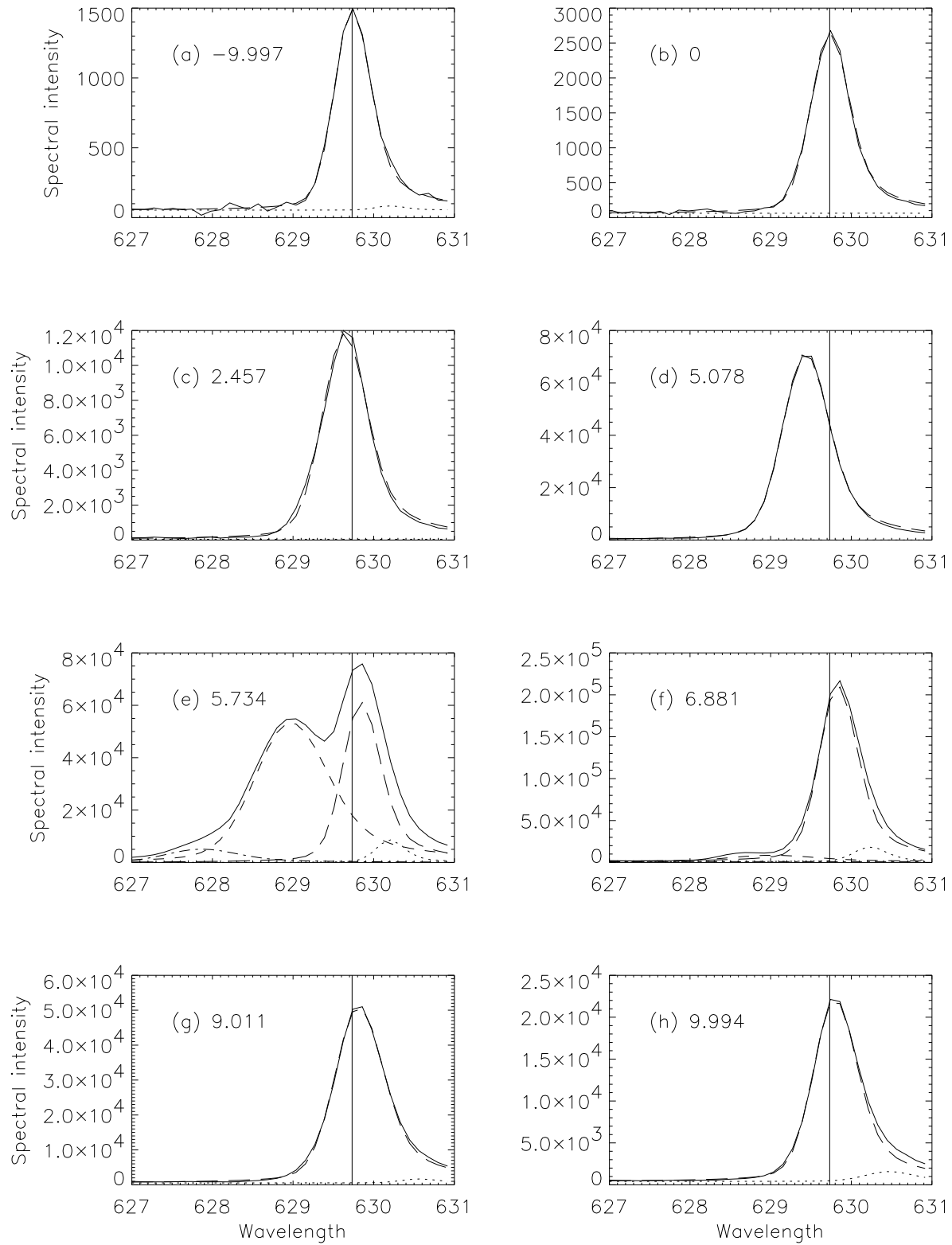


EUV Spectral Line Profiles During a Solar Flare



We observed Active Region 9502 on 2001 June 15 with *SOHO*'s Coronal Diagnostic Spectrometer (CDS) at high time resolution: EUV spectra were obtained every 9.8 s before, during, and after a moderate solar flare at 10:01 UT. Here we show emission line profiles in the O⁺⁴ (O V) waveband at selected times (given in minutes from 10:00 UT in each frame) during our observing run. The measured spectrum is displayed as a solid line. The x-axis corresponds to wavelength in Å, and the y-axis is the spectral intensity in ergs cm⁻² s⁻¹ sr⁻¹ Å⁻¹. The profile fit to the main component is displayed as a long-dashed curve, that to an unidentified component as a dotted curve, that to a near blueshifted component as a short-dashed curve, and that to a far blueshifted component as a dot-dashed curve. Solid vertical lines indicate the preflare measured wavelength against which we determine relative Doppler velocities. The entire line profile is blueshifted in frames (c) and (d), and redshifted in (g) and (h). The centroid blueshift in frame (d) corresponds to an upflow velocity of 144 km s⁻¹; the far and near blueshifted components in frame (e) correspond to upflow velocities of 890 and 363 km s⁻¹, while the redshifted component corresponds to a downflow velocity of 53 km s⁻¹; the centroid redshift in frame (g) corresponds to a downflow velocity of 38 km s⁻¹. The downflows provide evidence of “warm rain” due to cooling coronal flare plasma following chromospheric evaporation (evidenced by rapid upflows) during the impulsive phase. [From J. W. Brosius, *The Astrophysical Journal*, vol. 586, p. 1417 (2003 Apr. 1).]