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Spectral Analysis of Type IIb Supernova 1996cb

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We analyze the photospheric spectra of the 1993J-like supernova 1996cb by using the LTE supernova spectrum-synthesizing code SYNOW. Detailed line identifications are made and compared with those of SN 1993J. The evolution of the photospheric velocity we obtained can be coupled into the study of explosion model. We also can made some constraints on the velocity distributions of these identified ions in the ejecta. Some interesting discoveries are the Ni II lines and Co II lines in the very early times, i.e. formed in the very outer layer, and two components of Fe II ions with different velocities. We can confirm the previous identification of [OI] $\lambda 5577$ emission feature in the photospheric stage and its apparent blueshift, while the blueshift of HeI $\lambda 5876$ emission peak is proved due to the pollution of the adjacent strong H α P-cygni line. This is consistent with the results of the explosion model, that strong instabilities occur at the interface between the He and O layers while no or only weak ones between H and He layers.