

EARLY PHOTOGRAPHIC OBSERVATIONS OF RED AND INFRARED FEATURES IN THE SPECTRUM OF SN 1972e

(Abstract)

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When news of Kowal's discovery (1972) of SN 1972e in NGC 5253 was received at Cerro Tololo on 19 May 1972, an infrared plate was obtained with the Curtis Schmidt and its objective prism which revealed the presence of a faint emission feature between 8600 Å and 8700 Å. This was a Kodak IN plate, unhyposensitized and exposed for 25^m without a filter. On 21 May an exposure of 90^m was made on an ammonia-sensitized IN plate through a Wratten filter 89B. The Michigan combination objective prism of 10° with a reciprocal dispersion near 7590 Å of 570 Å mm⁻¹ was used, and the prominent emission-like feature centered at 8650 Å was confirmed.

The Schmidt results together with other spectrographic and photometric observations made at Cerro Tololo near maximum phase were reported by Osmer *et al.* (1972). Discussion of the 8650 Å feature and its possible identification with the Ca II triplet at 8498 Å, 8542 Å, 8662 Å, with O I at 8446 Å or with N I 8629 Å and 8683 Å was presented by McCarthy and Araya (1973) and by McCarthy (1973a, b). Further confirmation of this emission-like feature was obtained by image tube observations made later at Asiago by Ciatti (1973). The identification of the 8650 Å feature with the Ca triplet based on a long series of spectrum scanner observations at Palomar has been given by Searle (1973) and later by Kirshner (1974), and here by Mustel (1974). Herbig (1972) first photographed the deep depression near 8250 Å in SN 1972e and this was confirmed in our Cerro Tololo observations. This feature is similar to another deep depression noted in the red at 6175 Å by Ford and Rubin in type I supernovae (1967, 1968) and also observed in SN 1972e by Herbig (1972) and by McCarthy (1973a). Our objective prism spectra show the following features in the red and the near infrared spectra of SN 1972e near maximum phase:

Emission-like feature	Suggested sources	Deep depression feature	Wavelength difference
8650 Å	Ca II, N I, O I	8250 Å	— 400 Å
6550 Å	H, N II	6175 Å	— 375 Å

The association of strong emission-like features with the very deep depression some 400 Å to shortward wavelengths in both red and near infrared regions are the outstanding features present on these objective prism spectra obtained near maximum phase. The long series of spectra discussed by Searle and Kirshner and by Mustel

will be decisive in establishing at long last the mechanism responsible for the strong and strange features of type I supernovae spectra.

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