Early-time spectroscopy of the GRB 041218 optical transient with the 6-meter telescope

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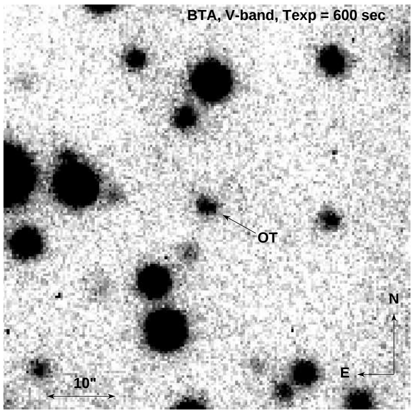
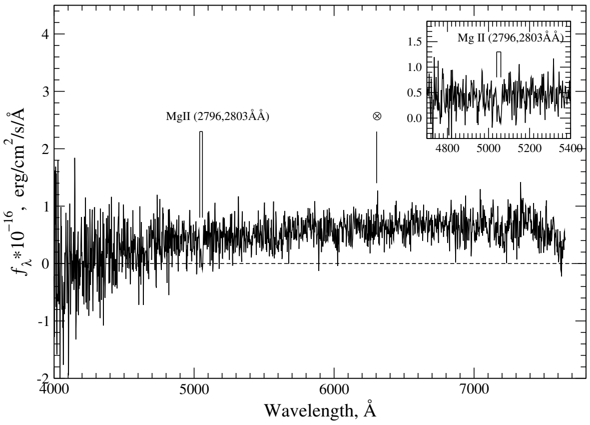
We present early-time spectroscopic observations of GRB 041218 optical transient (GRB OT). Observations were performed with the `SCORPIO` instrument attached at the primary focus of the 6-meter telescope of the SAO RAS.

The 60 seconds long GRB 041218 was detected with the `INTEGRAL Burst Alert System (IBAS)` on December 18, 2004 at 15:45:25 UT (Mereghetti et al., 2004, GCN #2858). 20 minutes later an afterglow candidate with brightness of about ~ 16.5 mag was found within the error box (Torii, 2004, GCN #2860). It was confirmed by Gorosabel et al. (2004, GCN #2861) that the object showed clear decay.

Our observations were started on December 18, 2004 at 21:59:04 UT, i.e. about 6^h after the burst. The spectrum taken is one of the earliest spectrum of GRB OTs obtained nowadays. The `VPHG550G` prism was used giving spectral resolution of $FWHM \approx 10$Å and range of 3500 – 7600ÅÅ. Total exposure time was 2 hours. Due to high Galactic extinction the final spectra were corrected to reproduce a "true" spectral slope. As can be seen from Figure, the spectrum is roughly flat with the presence of absorption features near 5000Å and probably near 6000Å. One of most probable identifications of the feature at $\approx$ 5000Å is the doublet of Magnesium. If our identification is true then the lower limit of the OT redshift is 0.80.



The V-band image of the GRB 041218 OT field on December 18, 2004 at 21:34:35 UT. The OT is marked by arrow. The brightness of the OT is $V = 22.26 \pm 0.06$. The size of the field is 1×1 arcmin.



The spectrum of the OT corrected for the Galactic extinction according to $E(B - V) = 0.634$. The mean epoch of the spectrum is December 18, 2004 at 23:17 UT. Most probable absorption line identification is also shown. If identification is true then lower limit of the OT redshift is 0.80.

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