The afterglow and complex environment of the optically dim burst GRB 980613 - DTU Orbit
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We report the identification of the optical afterglow of GRB 980613 in R- and I-band images obtained between 16 and 48 hr after the gamma-ray burst. Early near-infrared (NIR) H and K' observations are also reported. The afterglow was optically faint (R approximate to 23) at discovery but did not exhibit an unusually rapid decay (power-law decay slope alpha <1.8 at 2σ). The optical/NIR spectral index (β(RH) <1.1) was consistent with the optical-to-X-ray spectral index (beta(RX) approximate to 0.6), indicating a maximal reddening of the afterglow of approximate to0.46 mag in R. Hence, the dimness of the optical afterglow was mainly due to the fairly at spectral shape rather than internal reddening in the host galaxy. We also present late-time Hubble Space Telescope/Space Telescope Imaging Spectrograph images of the field in which GRB 980613 occurred, obtained 799 days after the burst. These images show that GRB 980613 was located close to a very compact, blue V = 26 : 1 object inside a complex region consisting of star-forming knots and/or interacting galaxy fragments. Therefore, GRB 980613 constitutes a strong case for the association of cosmological gamma-ray bursts with star-forming regions.
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