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### GRB 221009A: James Webb Space Telescope Observations

Levan, A.J.; Barclay, T.; Burns, E.; Cenko, S.B.; Chrimes, A.A.; D'Avanzo, P.; D'Elia, V.; Della Valle, M.; de Ugarte Postigo, A.; Fong, W.; Fruchter, A.S.; Gompertz, B.P.; Hedges, C.L.; Heintz, K.E.; Izzo, L.; Kann, D.A.; Kennea, J.A.; Floc'h, E.Le; Malesani, D.B.; Melandri, A.; Metzger, B.D.; Mullally, S.E.; Piranomonte, S.; Ravasio, M.E.; Racusin, J.L.; Rastinejad, J.C.; Salvaterra, R.; Sbarufatti, B.; Schneider, B.; Starling, R.L.C.; Tanvir, N.R.; Thoene, C.C.; Wijers, R.A.M.J.; Xu, D.

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FROM: Andrew Levan at U.of Leicester <a.levan@astro.ru.nl>

A. J. Levan (Radboud Univ.), T. Barclay (NASA/GSFC), E. Burns (LSU), S. B. Cenko (NASA/GSFC), A. A. Chimes (Radboud Univ.), P. D'Avanzo (INAF/OABr), V. D'Elia (INAF/OAR and ASI/SSDC), M. Della Valle (INAF/OAC), A. de Ugarte Postigo (Obs. Cote d'Azur), W. Fong (Northwestern), A. S. Fruchter (STScI), B. P. Gompertz (Birmingham), C. L. Hedges (NASA/GSFC), K. E. Heintz (DAWN/NBI), L. Izzo (DARK/NBI), D. A. Kann (Goethe Univ.), J. A. Kennea (PSU), E. Le Floc'h (CEA Paris-Saclay), D. B. Malesani (Radboud Univ. and DAWN/NBI), A. Melandri (INAF/OAR), B. D. Metzger (Columbia and Flatiron/CCA), S. E. Mullally (STScI), S. Piranomonte (INAF/OAR), M. E. Ravasio (Radboud Univ and INAF/OABr), J. L. Racusin (NASA/GSFC), J. C. Rastinejad (Northwestern), R. Salvaterra (INAF/IASF Milan), B. Sbarufatti (INAF/OABr), B. Schneider (CEA Paris-Saclay), R. L. C. Starling (U. Leicester), N. R. Tanvir (U. Leicester), C. C. Thoene (ASU-CAS), R. A. M. J. Wijers (Amsterdam), D. Xu (NAOC) report:

We observed the afterglow of GRB 221009A (Dichiara et al., GCN 32632; Kennea & Williams, GCN 32635; Bissaldi et al., GCN 32637; Veres et al., GCN 32636) with the James Webb Space Telescope on 22 October 2022, approximately 13 days after the Fermi/GBM trigger. Observations were obtained with the NIRSpec prism, spanning the range 0.6-5.3 microns at low resolution (exposure time 1803 s starting at 13:50 UT), and with MIRI using the Low Resolution Spectroscopy mode, spanning the range 5-12 microns (exposure time 555 s starting at 14:51 UT).

The optical/IR counterpart is well detected in both acquisition and spectral series, providing high signal to noise across the window. Based on provisional NIRSpec data the afterglow appears to be reasonably well described by an absorbed power-law (MW absorption,  $A_V = 4.2$  mag), with a relatively blue spectral slope ( $\nu^{-0.4}$ ), although we caution that the uncertainty in foreground absorption and photometric calibration means strong statements cannot be made at this stage.

Further analysis is ongoing.

We thank the staff of STScI for the rapid assessment of our DDT proposal (GO 2782, PI Levan) and in particular Alison Vick, Greg Sloan and Patrick Ogle for their work to get the observations rapidly into the schedule.