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The massive 2005 Da'Ure (Boina) rifting event, Afar (Ethiopia): the story so far from Geodesy, Seismology and Petrology

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Between 14 September and 8 October 2005, 162 earthquakes (m_b >4) occurred within the ~60 km long Da'Ure magmatic segment of the Afar rift, a nascent seafloor spreading centre in stretched continental lithosphere. Early InSAR results suggest this was the largest rifting event to have occurred in the era of satellite geodesy; simple elastic modelling shows that the entire magmatic segment opened by up to 8 m, yet seismic deformation can account for less than 10% of the observed deformation. First-order models of the interferograms indicate basaltic magma was injected along a dyke between depths of 2 and 8 km, corresponding to a total intrusion volume of ~ 2.5 km^3. Approximately 20% of the magma was sourced from shallow chambers beneath Dabbahu and Da'Ure stratovolcanoes at the northern end of the segment, where a felsic explosive fissural eruption occurred. Although comparable in magnitude to the 1975-1984 Krafla (Iceland) events, seismic data suggest that most of the Da'Ure dyke intrusion occurred in < 6 days. Here we present early results from InSAR, GPS, seismology and petrology.