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A faint persistent radio source associated to FRB20201124A

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We present the results of a campaign of observations, aimed at disclosing the origin of a persistent and extended radio emission embedding FRB 20201124A as found in Piro et al. 2021. New high resolution VLA observations show the presence on a flat-spectrum compact source coincident with the position of the FRB, that dominates the radio emission above 10 GHz. Spectral-imaging obtained with the Integral Field Unit MEGARA at the GCT does not exhibit any significant enhancement of luminous (as derived from $H\alpha$) or obscured star formation (as derived from $H\alpha/H\beta$) at the position of the compact radio source. On the contrary $H\alpha$ is well correlated with low-frequency radio emission, confirming its association with star formation. Upper limits from NOEMA at 250 GHz imply a conservative upper limit of about $2 M_{\odot} \text{yr}^{-1}$ at the position of the compact source, in contrast with the $>3 M_{\odot} \text{yr}^{-1}$ value expected if the radio flux of this source were produced by star formation. We conclude that compact flat radio source is likely associated to the central engine of the FRB, with a possible origin from a remnant of a magnetar, a compact merger or X-ray binary.

Research area

Transients

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