Reconnaissance report of the 21 July 2023 Jaipur earthquakes in Rajasthan, India

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In the early morning of 21 July 2023, a few low to moderate magnitude earthquakes struck the city of Jaipur in Rajasthan, India. These tremors were strong enough to wake up the city residents and were felt even in other relatively distant cities such as Jaisalmer and Delhi. This study reports preliminary findings of the reconnaissance conducted in Jaipur following these earthquakes. Field observations indicate a maximum seismic intensity V ('awakening') on the MSK 1964 intensity scale (IS 1893-1, 2016), which is consistent with the seismic zone (II) in which Jaipur city is located.

Keywords: Earthquakes, geological activities, reconnaissance report, seismic intensity, seismic zone.

IN India, [illegible] appreciably away from plate margins, the complicated geological history of the Indian subcontinent has led to the formation of faults and fractures, and therefore, occasional low to moderate magnitude earthquakes have been reported in the shield area[2,5,6].

The tremors of the 21 July 2023 Jaipur earthquakes were reportedly felt even in relatively distant cities such as Jaisalmer and Delhi. This, together with the news reports of the alarm caused by the earthquakes among local city residents, seemed to cast doubts concerning the appropriateness of the existing seismic zone (II) designated for Jaipur city and hence warranted an investigation. Therefore, on 22 and 23 July 2023, a two-member team from the Department of Earthquake Engineering, Indian Institute of Technology Roorkee (viz. B.K.M. and V.K.S. of this study) conducted a reconnaissance in the epicentral zone of the 21 July 2023, Jaipur earthquake. This article presents a brief report on the preliminary findings obtained from the survey.

The diverse physiographic regions of Rajasthan have been shaped by geological activities during the Late Tertiary and Quaternary periods. The Aravalli Mountain Range, which stretches from northeast to southwest Rajasthan contains the oldest rocks (Archean and Proterozoic) and is