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New paleoseismic data for the Ibigawa and Mugigawa faults, Nobi active fault zone, central Japan

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The Ibigawa and Mugigawa faults are northwest-trending active left-lateral faults in the Nobi active fault zone (NAFZ), central Japan. The 1891 Mw 7.5 Nobi earthquake ruptured three left-lateral faults in the NAFZ, but did not rupture the Ibigawa and Mugigawa faults, despite their proximity to the 1891 source faults. To obtain better paleoseismic data of those faults, we have opened new exploratory trenches at two sites: one at Oi site along the Ibigawa fault, and the other at Okudani-Hiraso-hora site along the Mugigawa fault. The trench at Oi site revealed stratigraphic record of four paleoseismic events that occurred during the last ~20,000 years. The timing of these events is estimated at 20-17 ka, 14-12 ka, 10-7.3 ka, and 2.8-0.2 ka, in the ascending order. One of the two trenches excavated at Okudani-Hiraso-hora site also exposed a fault that cuts and deforms Holocene sediments, but retained stratigraphic record of only one paleoseismic event, i.e., the most recent event. Radiocarbon dates from the trench suggests that the Mugigawa fault ruptured in the historical time after 1040 AD. The other trench at Okudani-Hiraso-hora site did not expose any deformational feature, unfortunately. Although our trenches yielded some new paleoseismic data, further on-fault and off-fault efforts are needed to reveal paleoseismic history of the NAFZ and discuss factors that control inter-fault rupture propagation.
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Keywords: 1891 Nobi earthquake, Nobi active fault zone, Ibigawa fault, Mugigawa fault, paleoseismology, exploratory trench