Testing continuity of the Hadean-Eoarchean geodynamo with zircon paleomagnetism

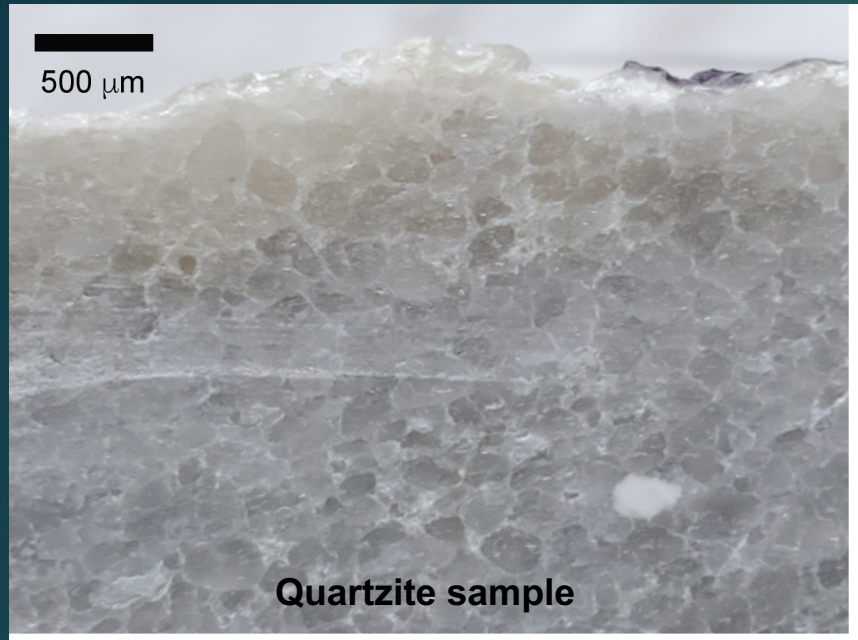
John A. Tarduno[1,2*], Rory D. Cottrell[1], and Axel Hofmann[3]

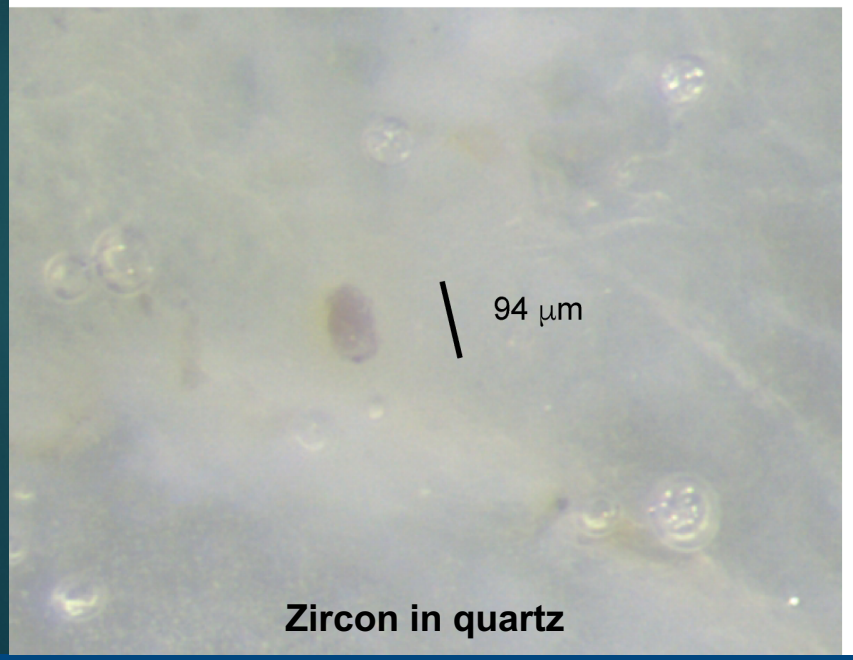
[1] *Department of Earth & Environmental Sciences, University of Rochester, Rochester, New York, USA*
[2] *Department of Physics & Astronomy, University of Rochester, Rochester, New York USA*
[3] *Department of Geology, University of Johannesburg, Johannesburg, South Africa*

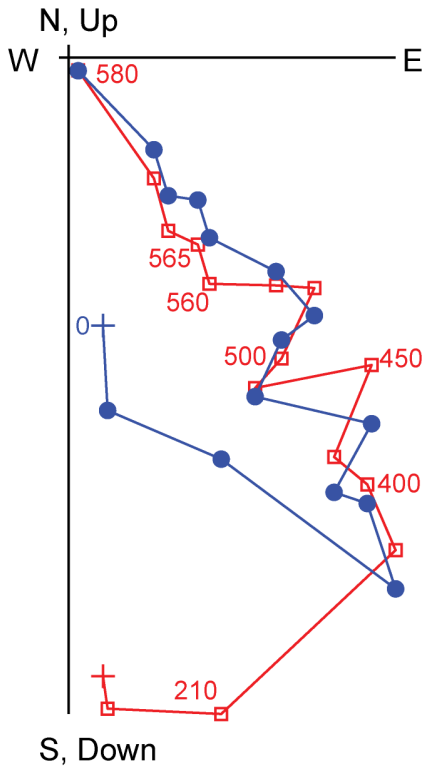
Presentation for EGU, 2020

** The presenting author is presently serving on COVID-19 emergency response teams at the University of Rochester. Apologies in advance if circumstances arise such that he cannot attend for discussions.*

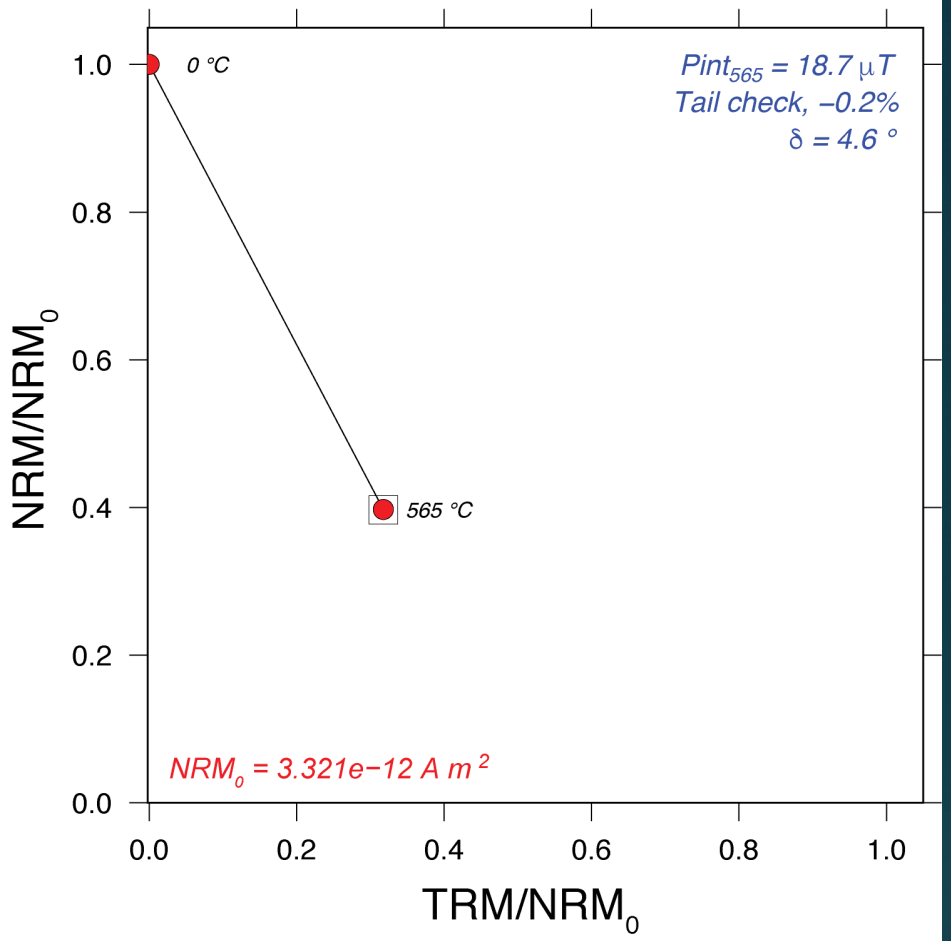
- Paleomagnetism, light and electron microscopy and geochemistry indicate the presence of primary magnetic inclusions in Jack Hills zircons that record a geodynamo extending to 4.2 billion years ago (Tarduno et al., Science, 2015; PNAS 2020)
- Dynamo appears continuous but there are 50 to 100 m.y. gaps in the available record Eoarchean to Hadean record
- We are studying zircons from several worldwide localities to further test the Hadean signals and continuity of the geodynamo
- Here our recent studies of Mesoarchean to Eoarchean age from quartzites of India (pictured) are highlighted



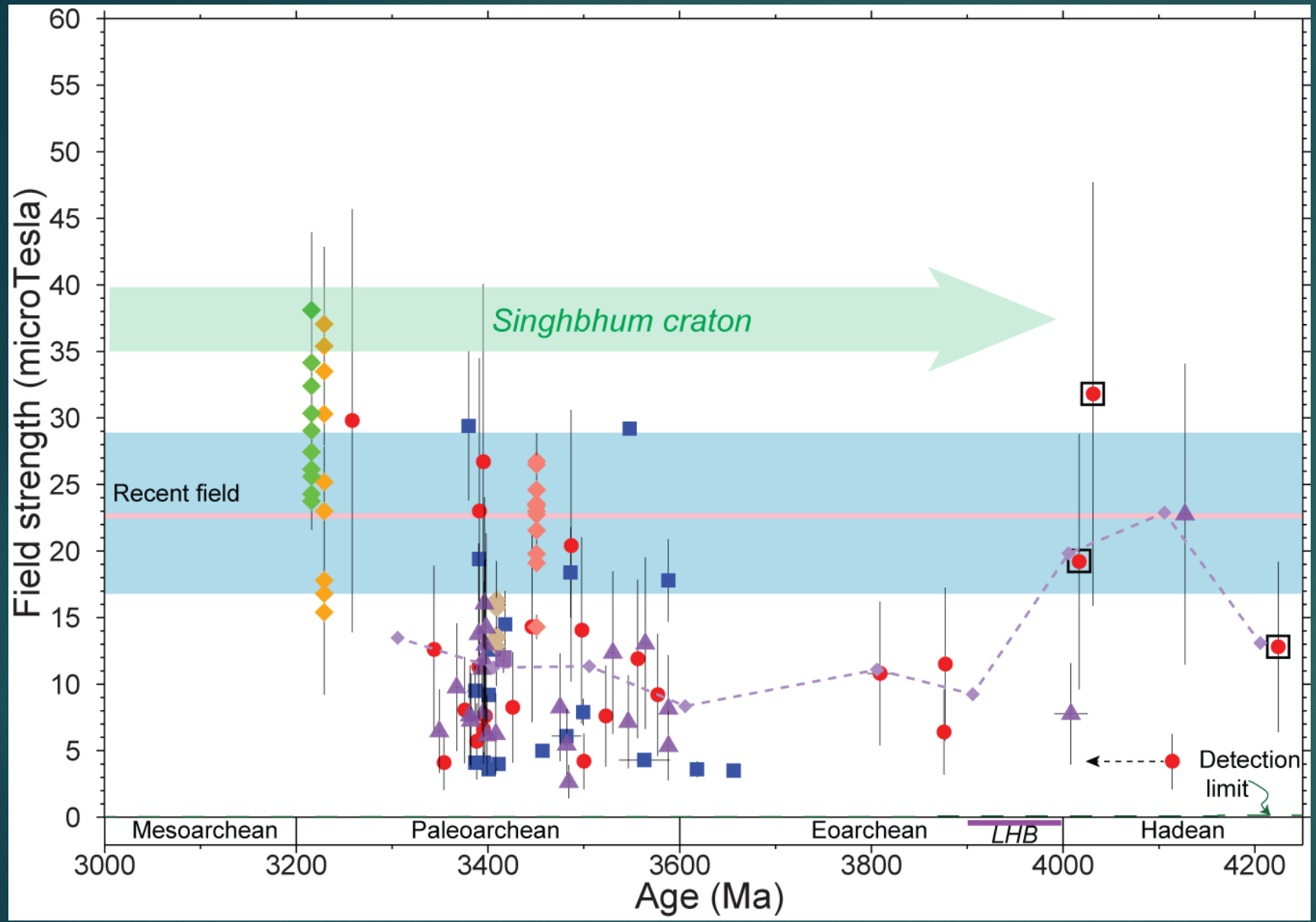




Orthogonal vector plot of thermal demagnetization



565 °C paleointensity analysis (see Tarduno et al., *Science* 2015)



Summary Mesoarchean to Hadean paleointensity (see Tarduno et al., 2015; 2020) and age of Singhbhum craton zircons currently being investigated at the University of Rochester