

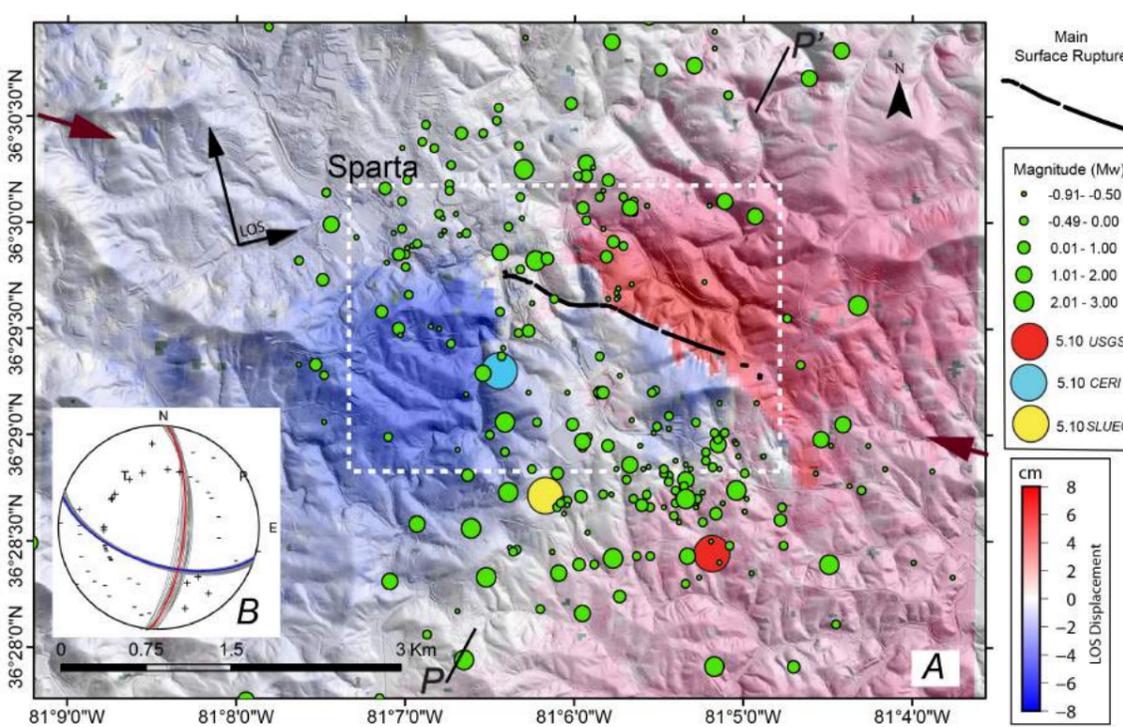
SOLID EARTH SEMINARS

THE 2020 MW 5.1 SPARTA, NORTH CAROLINA EARTHQUAKE SURFACE RUPTURE AND RECURRENT QUATERNARY DEFORMATION - SUBTLE DEFORMATION EVIDENCE IN AN INTERPLATE SETTING

Paula Marques Figueiredo

SEISMOLOGICAL STUDIES OF THE 2020 M5.1 SPARTA EARTHQUAKE SEQUENCE, NORTH CAROLINA

Miguel Neves



The Mw 5.1 earthquake on August 9, 2020, near Sparta, North Carolina, is the first historically recognized surface rupture in the eastern USA. Field surveys identified a surface rupture trending $\sim N 110^\circ$, with reverse scarps & folding/flexure of the hanging wall, which are consistent with an oblique-reverse focal mechanism in a WNW-ESE southwest dipping structure. The earthquake was triggered on a previously unknown fault, with the re-activation of pre-existent discontinuities in metamorphic bedrock, showing fracturing and rotation of Paleozoic foliation into a younger brittle zone. Geophysical surveys (GPR & ERT) corroborated a fault zone, SW dipping. High-resolution Post-Earthquake Lidar extended the initial mapping of the surface rupture to ~ 4.5 km. Relocation of seismic sequence supports field data and suggests that the earthquake had a blind section, in a complex fault zone, which seems to match subtle lineaments in the landscape. Paleoseismological excavations show evidence for Pleistocene recurrence.

ZOOM



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PASS: 2021_RG234

<https://videoconf-colibri.zoom.us/j/89018419156>