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## PP44A-03: Testing the age calibration of the Newark-Hartford APTS by magnetostratigraphic correlation of U-Pb zircon-dated tuffaceous beds in the Late Triassic Chinle Formation in core PFNP-1A from the Petrified Forest National Park (Arizona, USA)

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**Thursday, 14 December 2017**

**16:30 - 16:45**

📍 *New Orleans Ernest N. Morial Convention Center - 352*

The Newark-Hartford APTS extends over 27 Myr according to cycle stratigraphy of the Norian and Rhaetian of the Late Triassic and Hettangian and Sinemurian of the Early Jurassic and an additional ~6 Myr by extrapolation into the Carnian; the entire sequence is anchored by U-Pb zircon dating of CAMP activity that provides a calibration date of 201.6 Ma for Chron E23r just below the end-Triassic extinction and the earliest CAMP basalts in the Newark basin (Blackburn+2013 Science; Kent+2017 ESR). The developing APTS has been successfully used for global correlations in marine and non-marine facies but there have been ongoing suggestions that millions of years of Rhaetian time are missing in a cryptic unconformity that supposedly occurs just above E23r in the Newark Supergroup basins. Testing the continuity of the APTS by magnetostratigraphic correlation of U-Pb zircon-dated tuffaceous beds in the Chinle Formation was a prime scientific objective for core PFNP-1A. Paleomagnetic results were obtained using stepwise thermal demagnetization to 680°C from >150 samples of finer-grained red lithologies from the upper 250 m of the cored section of the Chinle (upper Sonsela, Petrified Forest including the Black Forest Bed, and lower Owl Rock Members). Characteristic directions isolated in 2/3 of the samples showed antipodal directions that were shallow with respect to reference directions (flattening factor ~0.5), consistent with early acquisition of remanence. Seven polarity magnetozones produce a distinctive pattern correlated to Chrons E17r to E14r of the APTS. The Black Forest Bed at 209.93±0.26 Ma (Ramezani+2011 GSAB), confirmed by our new U-Pb dates from core PFNP-1A, occurs in a reverse polarity magnetozone correlated to E16r (209.95–210.25 Ma), which puts the U-Pb zircon date(s) in excellent agreement with the inferred APTS age. Rather than a 'missing Rhaetian', the apparent regional differences in appearances and disappearances of palynoflora, conchostracans, and other endemic taxa in continental deposits are more likely a reflection of demonstrated continental drift across climate belts and the misinterpretation of ecostratigraphy as chronostratigraphy. A suite of new U-Pb dates in conjunction with paleomagnetic analyses in PFNP-1A is expected to calibrate much of Triassic succession of the Colorado Plateau.

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