Geologic Setting of the Colorado Plateau & Transition Zone

Colorado Plateau:
- Average elevation ~1900m
- Continental average ~7200m
- Little internal strain
- ~115 km of Palaeozoic strata
- ~3 km of Mesozoic strata

Transition zone:
- Proterozoic igneous & metamorphic basement
- Discontinuous exposures of Middle-late Proterozoic sediments
- Palaeozoic platform sequences
- Tertiary volcanic & sedimentary rocks (~1200 meters elevation gain from the Basin & Range province to the top of the Mogollon rim escarpment)
- Elevation (meters)
- High: 4396
- Low: 125

Prior Work on the Colorado Plateau
Flowers et al. (2006) have shown that subaerial weathering and the development of high relief began at the southwestern plateau margins during the Sierran-Laramide orogeny (80-50 Ma) progressing to the north east along the plateau margin through ~28 Ma, followed by denudation progressing to the north east from ~28 Ma through ~10 Ma. They conclude that the later stages of denudation can be explained solely by denudational denudation due to shifting of the southwestern plateau, and thus the ~80-50 Ma exhumation has the most relevance for understanding the mechanisms by which the Colorado Plateau uplift occurred.

Sample Locations for Transition Zone Study
- Samples collected July 2008
- to be analyzed for Apatite & zircon helium ages

Initial He/He in Apatite Ages (aHe)
- 1.4 grains per sample location analyzed

Radiation Damage Model for Apatite Helium Ages
Increasing radiation damage with apatite crystals increases helium reactivity.

Results of HeFTY Modeling

Geologic Histories derived from Arizona County Geologic Maps

Conclusions:
- No significant results from the off-axis area from the Basin & Range region show that radiation damage is not significant nor would be expected to cause significant errors in HeFTY modeling.
- For future work, additional samples or multiple samples will be analyzed.