Finding and Defining the Edges of Stable North America: Reference Frame Effects vs. Real Tectonics

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Velocities Relative to SNARF

ITRF velocities rotated onto official SNARF velocities at 84 common sites

Unexplained anomalous NNE motion of the Great Plains (see also Calais et al., 2006)
Testing SNARF

Is anomalous motion result of how transformation to SNARF is made?

Unexplained anomalous NNE motion of the Great Plains (see also Calais et al., 2006)
Testing SNARF

Is anomalous motion result of the choice of common sites with SNARF?
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Unexplained anomalous NNE motion of the Great Plains (see also Calais et al., 2006)
Velocities Relative to UNR-NA

Velocities obtained from position time-series in UNR-NA frame

Great Plains is rigid and moves with North America
SNARF velocities themselves seem not to be biased.
Velocities Relative to UNR-NA

- Relative UNR-NA signal
- SE motion of southern Montana
- Rapid extension across Wasatch
- SW motion of western Texas
- Unresolved strain accumulation across Rockies and Rio Grande
- Deformation across Oklahoma ?
- New Madrid ?
Conclusions

Last few WG meetings I indicated that one should not use the published SNARF pole, but transform ITRF velocities into SNARF.

Now, we have strong evidence that that practice also leads to biased velocities.

Recommendation is that the preferred approach, as stated in earlier WG meetings, is to provide to the user daily transformation parameters such that proper SNARF velocities can be obtained.

In that case, various interesting (real?) features start to appear in the data.