Tectonic Processes

Retreating Trench, Extension, and Accretion Tectonics (RETREAT) GPS in the Northern Apennines, Northern Italy

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Geologists have known for more than a hundred years, dating back to Edward Suess, that horizontal contraction and extension can occur simultaneously in convergent mountain belts. This paradox remains a fundamental and largely unresolved problem in continental dynamics. To help address this problem, we are measuring the present-day pattern of crustal deformation associated with active tectonic processes in the northern Apennines in northern Italy. The year 2007 represents the fifth year of the five-year project funded by NSF Continental Dynamics. The GPS experiment represents one component of a multi-disciplinary effort to understand the geodynamic processes underlying syn-convergent extension. The GPS experiment has benefited tremendously from UNAVCO facility support each year since 2003. We return to the field in June 2007 to run our semi-continuous stations from June to October 2007. We will perform our fifth campaign this October 2007.

Figure 1. RETREAT GPS network equipment in place.
Figure 2. RETREAT GPS network map: triangles represent RETREAT campaign sites first measured in 2003 (turquoise), 2004 (red), and 2005 (blue), RETREAT semi-continuous sites (orange squares), and RETREAT continuous sites (yellow squares) and other continuous GPS stations in northern Italy operated by multiple institutions (yellow dots).