Seismicity on the Mid-Atlantic Ridge and Changes in Transatlantic VLBI Baselines

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Baseline rates as predicted by the current geophysical models (such as NUVEL-1) and the ones inferred from the very long baseline interferometry (VLBI) measurements which span several years are in close agreement for the majority of the VLBI baselines. Nevertheless, some of the baseline rates calculated over shorter periods are significantly different from their long-term rates, presumably as a result of the episodic nature of the plate motions. We have begun analyzing the VLBI geodetic results obtained during the 1979-1990 period, and found that there is a statistically significant variation in some of the baseline rates prior to pronounced seismic activity along the boundary of the North American and Eurasian plates (Mid-Atlantic Ridge). In general, no statistically significant anomalous rates have been found accompanied by pronounced seismic activity before or after them. However, rates calculated for Hras-Wettzell and Richmond-Wettzell baselines, using 14 month batches of data before August, 1988, indicate sharp and simultaneous variations from their long-term averages (for example 52.8 $\pm$ 7.7 mm/yr versus 14.0 $\pm$ 0.7 mm/yr for Hras-Wettzell and 30.1 $\pm$ 7.4 mm/yr versus 13.6 $\pm$ 0.5 mm/yr for Richmond-Wettzell) but no significant variations are observed for the Westford-Wettzell baseline using the data for the same time period.

1. 1992 Fall Meeting
2. 000111418
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5. a) 1209 Crustal Movements
   7245 Structure of the crust
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7. 0%
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   Purchase Order S-98590-E
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