



Foreshocks, crustal heterogeneity and earthquake prediction

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The incidence of foreshocks before the occurrence of strong mainshocks has been traditionally considered as one of the most powerful tools for the mainshocks' prediction. Recent advances show that the foreshocks incidence depends on the crustal heterogeneity. More precisely, it seems that the foreshocks incidence is favoured by the increased degree of small-scale crustal heterogeneity. The test site of Killini seismogenic region, Ionian Sea, Greece, has been selected to test this hypothesis. It has been found that the strong ($M \sim 5.8$) mainshocks are systematically preceded by foreshock sequences lasting for about five months. Seismically calibrated cross-sections along with drilling results indicate highly heterogeneous structure from geological point of view. Moreover, the increased CLVD components in the earthquake focal mechanisms along with the increased b-value constitute additional evidence for high crustal heterogeneity and/or complicated seismic sources. A survey of the Greek seismicity indicates that at least 50% of the strong mainshocks are preceded by foreshocks and that the incidence of foreshocks is a decreasing function of the mainshock focal depth which verifies the hypothesis.