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Link between Coulomb stress changes and seismic activation in the Marmara sea after the Izmit (Turkey) earthquake

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We have investigated the role of the dynamic and static stress changes after the 1999 Izmit earthquake, on four pre-existing seismic clusters located in the eastern Marmara sea, beyond the western end of the earthquake rupture. These four clusters show long-lasting modifications in their seismicity rate. We observe that these seismic activity variations are strongly related to the stress changes. Where the dynamic stress changes are important, the activation is instantaneous, whereas when the static stress changes are positive and large, the activation lasts longer. When static stress changes are negative, we observe the appearance of a seismicity shadow. However, one of the clusters, the Yalova cluster, does not reply in this way. In spite of a negative stress change, its activity is strongly increased for a long duration. We infer that this activation is due to an increase of the pressure after the earthquake. We also highlight that the delay of activation is linked to the type of faulting. Clusters located on the strike-slip faults are immediately activated, whereas the extensional ones are activated after a delay.