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Stress change and fault interaction from a two century-long earthquake sequence in the central Tell Atlas (Algeria)

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The Tell Atlas of northern Algeria has been the site of several destructive seismic events in the past century. The active zone located along the plate boundary experienced recently the Mw 7.3 El Asnam earthquake in 1980 and the Mw 6.8 Zemmouri earthquake in 2003. We explore here the physical pattern for a stress transfer along the Tell thrust-and-fold belt taking into account the northeast trending earthquake migration from 1891 to 2003 with Mw $\geq$ 6. Static stress change calculations using Coulomb software (3.4 version) are obtained using specified coseismic ruptures of major earthquakes and the block tectonics with en-echelon geometry along the Tell Atlas. The stress transfer progression and increase of 0.1 to 0.8 bar are obtained on fault planes at 7-km-depth with a friction coefficient μ' 0.4 showing stress loading lobes on targeted coseismic fault zone and location of stress shadow across other thrust-and-fold regions. The Coulomb modelling suggest a distinction in earthquake triggering between zones with moderate-sized and large earthquake ruptures. Recent geodetic (InSAR and levelling) studies and aftershocks that document postseismic deformation of major earthquakes are integrated into the static stress change calculations. A seismic strain rate and Coulomb modelling provide some constraints into the seismic hazard assessment of north-central Algeria.