Review of SE MS 2012-39 ‘‘Causes of earthquakes and lithospheric plates movement’’ by Ostrihansky

The variations in Earth rotation driven by the fortnightly tide do not involve any gravitational torque applied to the Earth: rather, they occur because of the changes of the moment of inertia caused by the deformational response to the tides. So the only forces associated with these changes are the apparent forces driven by the acceleration and deceleration. To get the size of these accelerations, consider the following: the change in rotation rate is 1.5×10^{-8} of the rotation. At the Equator, the velocity caused by rotation is r*omega, where r is 6.4×10^{6} m and ω is $2\pi/T$, where T is 86400 s: so the velocity is 463 m/s, and the amplitude of velocity change is 7×10^{-6} m/s. To get the peak acceleration, multipl by ω for a fortnightly change $\omega = 2\pi/(13.66 \times 86400) = 5.3^{-6}$ rad/s and we get a maximum acceleration of $a = 4 \times 10^{-11}$ m/s^2.

Now consider a block of rock 8000 km long (the other dimensions do not matter); to accelerate this at the given rate would require a pressure of $ah\rho$ (using pressure means that the other dimensions drop out); this is

$$(4 \times 10^{-11}) \times (8 \times 10^{6}) \times (3.5 \times 10^{3}) = 1.0\text{Pa}$$

which is the pressure of a fairly good vacuum, and needless to say very far below the ambient pressure, the stresses from tides, or the stresses released in earthquakes.

So the whole concept is physically somewhere between absurd and *very* implausible – it could only be taken seriously given very strong evidence, not weak statistical results.