

Abstract Submitted
for the NWS06 Meeting of
The American Physical Society

Tidal Locking Of The Earth MICHAEL KOOHAFKAN, The Evergreen State College — The Moon’s orbit and spin period are nearly synchronized, or tidally locked. Could the Moon’s orbit and the Earth’s spin eventually synchronize as well? The Moon’s gravitational pull on the Earth produces tides in our oceans, and tidal friction gradually lengthens our days. Less obvious gravitational interactions between the Earth and Moon may also have effects on Earth’s spin. The Earth is slightly distorted into an egg-like shape, and the torque exerted by the Moon on our equatorial bulge slowly changes the tilt of our spin axis. How do effects such as these change as the Moon drifts away from Earth? I will examine gravitational interactions between Earth and Moon to learn how they contribute to the deceleration of the Earth’s rotation. My goal is to determine the amount of time it would take for the Earth’s rotational speed to decelerate until the period of a single rotation matches the period of the Moon’s orbit around Earth – when the Earth is “tidally locked” with the Moon. I aim to derive a general mathematical expression for the rotational deceleration of the Earth due to Moon’s gravitational influences.

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Date submitted: 21 Apr 2006

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