

# Relationship between tidal principal direction in the deep moonquakes nest and their events occurrence

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The Apollo seismic experiment carries out from 1969 to 1977 found existence of moonquakes (deep moonquakes, shallow moonquakes, thermal moonquakes, and meteoroid impacts) and provided us very unique characteristics of the deep moonquakes. One of the most interesting characteristics is that their occurrences are likely to be correlated with the lunar tide (e.g. Lammlein, 1977; Nakamura, 1978). Although some of hypotheses for mechanisms of occurrence of deep moonquakes were reported and several studies were made on the temporal correlation of the deep moonquakes with lunar tide, no detailed studies have been made on tidal stress itself at a focal region of the deep moonquake.

In this study, we compared the lunar libration obtained from lunar ephemeris ELP2000-85, a very good agreement with JPL's DE405, with occurrence times of deep moonquake, and searched common characteristics of directions of the lunar libration at any deep moonquake's nests.

The numerical results indicate that temporal variations of principal stress and its moving direction largely depend on locations of deep moonquake's nest, and it is clear that many hypocenters have a large number of moonquake's events when directions of lunar libration move from southwest to northwest. In the hypocenter group of deep moonquake with occurrence tendency of events, lunar tide has high possibility of action as a trigger of deep moonquake's occurrences.