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Temporal linkages between the lunar tide and North Atlantic time series

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The Faroe-Shetland time series and the Kola time series cover a time period of more than hundred years and represent some of the longest oceanographic time series in the world. The time series of sea level and sea temperature outside the Norwegian coastline covers the period from about 1930's. The relation between these important time series is examined in this paper, which presents for the first time some relations between of the annual mean sea level, the sea temperature and salinity from the North Atlantic water and the Modified North Atlantic Water in the Faroe Shetland Channel, the annual mean sea level and sea temperature at the Norwegian coast line. The investigation is based on a wavelet spectrum analysis used to identify the dominant cycle periods and cycle phases in all time series. The investigation has identified a correlation from R=0.5 to about R=0.9 between dominant 18 yr wavelet cycles and the 18.6 year lunar nodal cycle.

The identified 18 year cycles seem to have a temporary stationary cycle time and a time variant phase. The phase difference indicates we may summarize the results in a South region, a West region and a North region. The South region is seems to have an unstable system. The west region from Bergen to Kr.sund seems to have a stable system. The phase relation to the temperature fluctuation at the Scottish channel is 1.0π (rad). The dominant cycles in the North region has about the same phase as the same phase from Bodo to the Kola section in the Barents Sea. A possible explanation is that the sea level phase delay from the south region to the north region is caused by a vertical and a horizontal 18.6 yr tidal component. The phase delay between the sea level fluctuation and the sea temperature fluctuation may caused by the vertical 18.6 yr lunar nodal tide. The implication of this analysis is that the dominant temperature fluctuation on the Norwegian coastline is a temporary deterministic process caused by

a gravity force to the Moon.