Semi-lunar modulation of precipitation, ozone, sunshine, thunderstorm and global temperatures is sometimes called Bowen’s signal. Possible source of variation are galactic cosmic rays (GCR) affected by solar activity and by lunar influence on the Earth’s magnetosphere. The question whether GCR may directly affect the troposphere, providing an effective indirect solar forcing mechanism, was raised in IPCC AR3 and is investigated in the CLOUD experiment at CERN.

**Method** of superposition of epochs (MSE) with synodic month as epoch and new moon as the null day was implemented. The semi-lunar variation was quantified by correlation coefficient between semi-lunar cosine function (period $4\pi/29.53$) and the vectors of means from the MSE matrices.

**Daily data**: mean cloudiness in period 1775-2010 and precipitation amounts in period 1804-2010 at Prague-Klementinum, fog occurrence 1961-2010 at two different Czech stations.

**Results**: The correlation coefficients were not statistically important in most cases but they had characteristic quasi-periodic course, persisting in all series and related probably to solar cycle. Semi-lunar variation in cloudiness is more distinctive than in precipitation. The results for fog stations differ relatively to their orography. We register number of slight shifts in timing between the series and several cases of obscure phase reversals.

**Discussion**: Even though only faint statistical signals were found, the results are convincing. From quasi-persistency of the signals and from ocular relationship to solar cycle it can be concluded that there is physical connection.

**Conclusion**: Semi-lunar variation seems to be affected by solar activity. The physical mechanisms should be further studied.