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Possible Sunspot Effects on Precipitation Totals over Northern Coasts of Persian Gulf and Oman Sea

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In this study, the relationship between annual sunspot number (ASN) and annual precipitation totals (APT) has been investigated over the northern coasts of the Persian Gulf and Oman Sea by using two statistical methods: contingency tables and cross-correlation function. Only Bushehr and Jask stations (270 mm and 140 mm mean APT) have long term monthly precipitation records started instrumentally from 1878 and 1893 respectively and remade data until 2005. Results indicate negative significant cross-correlation coefficients between 3-year lagged ASN and APT over the coasts but with a slight effect. For obtaining reliable results, several contingency tables, more than 30 cases, have been executed with different categories and different lengths of categories but mostly focused on high, medium and low numbers for sunspot and wet, normal and dry years for precipitation. Almost in all cases of Jask (as a sample for Oman coasts), the Chi-square tests are significant at 5% level while there are minor cases for Bushehr (as a sample for Persian Gulf coasts). It indicates statistical relationships between lagged ASN and APT over Oman coasts while there is a problematic relationship over Persian Gulf coasts. The latter coasts are subjected to the external circulation currents such as Mediterranean westerlies that may filters sunspot effects. But Oman coasts, where elongated around 25 °N zone, rather belongs to subtropical high. The different synoptic climatology may be one of the reasons of the different obtaining results. Since the sunspot number is being reliably predicted, the future precipitation climatology may be emerged relatively.