

Period characteristics of representative hydrological series in the Yellow River using maximum entropy spectra analysis

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Abstract A hydrological series is composed of a non-periodic component, a periodic component and a stochastic component. Spectral analysis is an effective tool for extracting stochastic characteristics of time series. Maximum Entropy Spectra Analysis (MESA) has certain advantages. Here, MESA is employed to detect the periodicity characteristics of the monthly runoff series, annual runoff series and annual maximum flood peak series of the Yellow River at Huayuankou station. The subsection technique is used to compare whether the periods obtained have consistency and stability. The following conclusions are drawn: (a) the 1st to 4th periods of the monthly runoff series take the values of 12, 6, 4 and 3 months, respectively; (b) the 1st to 2nd periods of annual runoff series takes the value of 3 and 4 years, respectively; (c) there is no significant period in the annual maximum flood peak series.

Key words hydrological series; maximum entropy spectra analysis (MESA); period characteristic; the Yellow River
