ABSTRACT

FOURIER, POWER SPECTRUM, AND CROSS-CORRELATION
ANALYSIS OF HYDROGRAPH DATA OF SELECTED
MEKONG BASIN RIVER GAUGING STATIONS

by

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Employing Fourier analysis to transform time series data associated with principle hydrologic variables from the spatial to the frequency domains, a power spectrum and cross-correlation analysis can be applied to the study of large rivers to characterize the transformations in these systems between the input function (precipitation) and the output function (discharge or stage levels). When applied to data collected at selected gauging stations located along a 300 km reach of the Mekong River and a 60 km reach of the Tônlé Sap-Bassac Rivers (near Phnom Penh, Cambodia), this method offers quantifiable and objective criteria for determining that the reliability of the collected data is positive proof that intuitive riverine process correlate. Moreover, deviations
from an absolute correlation necessitate the need to further evaluate the system to determine what non-anthropogenic and/or anthropogenic phenomena cause the deviations.