December 1967 Brief 67-10602

NASA TECH BRIEF

New Technique for Determination of Cross-Power Spectral Density with Damped Oscillators

A new technique for computation of cross-power spectral density has been developed and programmed. In addition, a technique for discrimination between periodic and random signals has been developed which does not depend on either the spectral density or the amplitude distribution of the signal. Computations have been performed for a variety of signals with known characteristics with very satisfactory results.

This development is applicable to analysis of any stationary random process. It has been used in the analysis of unsteady pressures in separated flow (cross flow around a circular cylinder). The technique can be used in the following areas:

1. Aerospace
   a. Unsteady transonic flow
   b. turbulent flow (i.e., clear air turbulence)
   c. flight test structural dynamics data
2. Transportation
   a. Roadbed roughness data
   b. wave height data to characterize sea states
   c. structural dynamic data.

Note:

Additional details are contained in: *A New Technique for Determination of Cross-Power Spectral Density with Damped Oscillators,* by Wayne E. Simon and Louise A. Walker, Informal Report No. 18, Martin Marietta Corporation, July 1967.

Copies of this report are available from:
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Reference: B67-10602

Patent status:

No patent action is contemplated by NASA.

Source: W. E. Simon and L. A. Walker
of Martin Marietta Corporation
under contract to
Marshall Space Flight Center

(MFS-14022)

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