



Abstract View

[Volume 17, Issue 10 \(October 1987\)](#)

Journal of Physical Oceanography

Article: pp. 1786–1797 | [Abstract](#) | [PDF \(910K\)](#)

Statistics of S_{xy} Estimates

M.H. Freilich

Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA 91109

S.S. Pawka

Center for Coastal Studies, Scripps Institution of Oceanography, La Jolla, CA 92093

(Manuscript received March 19, 1986, in final form May 20, 1987)

DOI: 10.1175/1520-0485(1987)017<1786:SOSE>2.0.CO;2

ABSTRACT

The statistics of S_{xy} estimates derived from orthogonal-component measurements are examined. Based on results of Goodman, the probability density function (pdf) for $S_{xy}(f)$ estimates is derived, and a closed-form solution for arbitrary moments of the distribution is obtained. Characteristic functions are used to derive the exact pdf of S_{xy}^{tot} . In practice, a simple Gaussian approximation is found to be highly accurate even for relatively few degrees of freedom. Implications for experiment design are discussed, and a maximum likelihood estimator for a posteriori estimation is outlined.

Options:

- [Create Reference](#)
- [Email this Article](#)
- [Add to MyArchive](#)
- [Search AMS Glossary](#)

Search CrossRef for:

- [Articles Citing This Article](#)

Search Google Scholar for:

- [M.H. Freilich](#)
- [S.S. Pawka](#)



amsinfo@ametsoc.org Phone: 617-227-2425 Fax: 617-742-8718
[Allen Press, Inc.](#) assists in the online publication of *AMS* journals.