

# ELIMINATING CONTAMINATED SPECTRA

Mar 5, 2002

The sea-echo spectrum is sometimes contaminated by ionospheric echo or by interference from other radar signals. Ionospheric echo is quite common at the lower transmit frequencies used by Long Range SeaSonde. We check for contamination by comparing energy levels in the first-order region with those at surrounding frequencies. This process is applied separately for positive and negative Doppler frequencies, as in some cases the contamination occurs only on one side of the spectrum, the other side yielding valid current vectors.

The Bragg region is defined using standard methods, and we then calculate its total energy  $E$  and frequency-width  $W$ . The surrounding regions are defined as in the figure to have width  $1.5W$ , and the corresponding energies  $E_+$  and  $E_-$  calculated. In the absence of contamination, the Bragg peak dominates, so  $E$  is greater than  $E_+$  or  $E_-$ . Defining a factor ionfact ('Header' file line 11, parameter 3 which if missing defaults to a value of 1), we eliminate the Bragg region from the set to be analyzed for currents if  $E_+ > \text{ionfact} \times E$  or  $E_- > \text{ionfact} \times E$ .

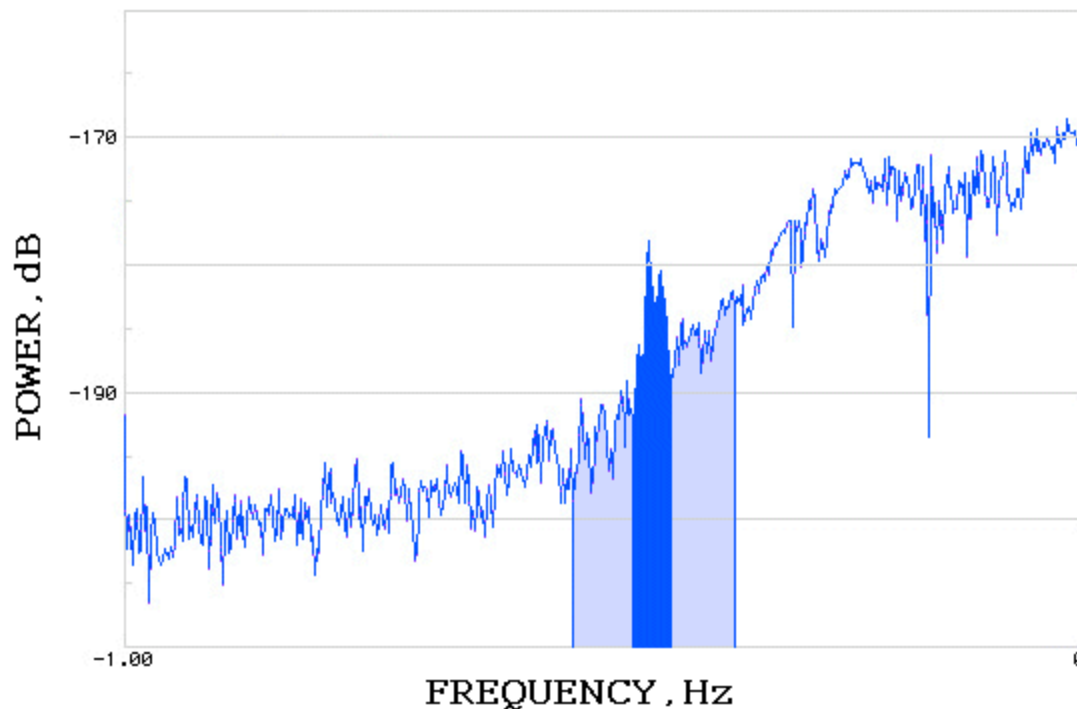


Figure illustrates the identification of a contaminated spectrum: energy in the first-order region (shaded dark) is compared with surrounding regions (shaded light).