Changes of Notation in Bloomfield

In 2000, a second edition of Bloomfield’s book was released. The course handouts, lectures, homeworks, and exam will still use the notation (as well as page numbers and exercise numbers) from the first edition. The first edition is no longer for sale from the publisher, although some used copies may be found for sale on the internet. The handouts are self-contained, but if you do buy the second edition of Bloomfield, here is a translation from the old to the new notation.

Frequency

In the first edition, frequency was denoted by $\omega$, and measured in radians per unit time. In the new edition, it is denoted by $f$, and measured in cycles per unit time. The two quantities are related by $\omega = 2\pi f$.

Frequency $f$ ranges from 0 to 1, while angular frequency $\omega$ ranges from $-\pi$ to $\pi$.

Fourier Frequencies

Old Notation: $\omega_j = \frac{2\pi j}{n}$. New Notation: $f_j = \frac{j}{n}$.

Discrete Fourier Transform

Old: $J(\omega)$. New: $d(f)$.

Periodogram

Old: $I(\omega) = \frac{n}{2\pi} |J(\omega)|^2$. New: $I(f) = n |d(f)|^2$. These differ by a factor of $2\pi$.

Spectral Density

Old: $f(\omega)$. New: $s(f)$.