

# **Ionospheric Scatter Parameters from Digital Ionograms**

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It is well known that High Frequency (HF) radio signals reflected from the ionosphere suffer time and frequency spreading due to scattering processes in the ionosphere. This is because the ionosphere is not an ideal, stationary, solid “mirror in the sky”, but a plasma of ions and free electrons, which is in continual motion and often contains moving irregularities. Consequently, besides the specular return due to ionospheric refraction, there may also be time-delayed scattered returns. This is particularly noticeable in equatorial and high-latitude regions, especially during spread-F conditions.

For predicting the performance of digital HF radio transmissions, it is important to know the relative power and time delay between the specular and scattered components of the received signals. A recent model for time and frequency spreading of ionospherically propagated HF signals in the equatorial region suggests that the scattered power is at least 6dB below the specular power and the standard deviation of the time spread of scatter is 1ms. This document presents a method for obtaining quantitative information on these two parameters to test this hypothesis.