Application of Dynamic Logic Algorithm to Inverse Scattering Problems Related to Plasma Diagnostics[1] L. PERLOVSKY, R.W. DEMING, V. SOTNIKOV, Sensors Directorate, Air Force Research Laboratory, Hanscom AFB, MA 01731 — In plasma diagnostics scattering of electromagnetic waves is widely used for identification of density and wave field perturbations. In the present work we use a powerful mathematical approach, dynamic logic (DL), to identify the spectra of scattered electromagnetic (EM) waves produced by the interaction of the incident EM wave with a Langmuir soliton in the presence of noise. The problem is especially difficult since the spectral amplitudes of the noise pattern are comparable with the amplitudes of the scattered waves. In the past DL has been applied to a number of complex problems in artificial intelligence, pattern recognition, and signal processing, resulting in revolutionary improvements. Here we demonstrate its application to plasma diagnostic problems.

Perlovsky, L.I., 2001. Neural Networks and Intellect: using model-based concepts. Oxford University Press, New York, NY.

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