

**On Maxwell-Boch systems with inhomogeneous broadening and one-sided nonzero  
background**

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**Abstract**

We present the inverse scattering transform to solve the Maxwell-Bloch system of equations that describes two-level systems with inhomogeneous broadening, in the case of optical pulses that do not vanish at infinity in the future. The inverse problem is formulated in terms of a suitable matrix Riemann-Hilbert problem, and the formulation of the direct scattering problem combines features of the methods with decaying as well as non-decaying fields. We also discuss the asymptotic state of the medium and of the optical pulse.