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Optical dispersion relations in two types of amorphous silicon using Adachi's expression

[Abstract](#)[References](#)[Citing Articles \(6\)](#)[Page Im](#)Download: PDF (188 kB) [Export: BibTeX or EndNote \(RIS\)](#)**M. Fried***Central Research Institute for Physics, Budapest, 114, H-1525, P.O. Box 49, Hungary***A. van Silfhout***Faculty of Applied Physics, Twente Technical University, P.O. Box 217, 7500 AE Enschede, The Netherlands*

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Using Adachi's expression [S. Adachi, Phys. Rev. B 43, 12 316 (1991)] for the complex dielectric function of amorphous semiconductors, we fit out experimental results [M. Fried *et al.*, J. Appl. Phys. 71, 5260 (1992)] for two different types (self-implanted and implanted-annealed or relaxed) of amorphous silicon. The complex dielectric functions were determined by spectroscopic ellipsometric measurements in the visible wavelength region. The fit resulted in different optical band gap (E_g) and damping (or broadening, Γ) energies. E_g is lower and Γ is higher in implanted *a*-Si. Both changes can be interpreted by the presence of more structural disorder point defects in implanted *a*-Si compared with relaxed *a*-Si.

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