

Abstract Submitted  
for the 4CF13 Meeting of  
The American Physical Society

**Optical constants of Ni<sub>1-x</sub>Pt<sub>x</sub> silicides from spectroscopic ellipsometry** LINA ABDALLAH, STEFAN ZOLLNER, New Mexico State University, CHRISTIAN LAVOIE, IBM Research Division, AHMET OZCAN, IBM Systems and Technology Group, MARK RAYMOND, GLOBALFOUNDRIES — We provide a comprehensive analysis of the dielectric function and optical conductivity for nickel platinum silicides with different platinum concentrations (0 to 30 at.% Pt). After determining accurate optical constants of Ni<sub>1-x</sub>Pt<sub>x</sub>, alloys with the same thickness were deposited directly on Si to study the optical constants of silicides. Ellipsometric measurements were performed over the same photon energy range (0.6 to 6.6 eV). During Ni<sub>1-x</sub>Pt<sub>x</sub> deposition on Si, some metal atoms will diffuse into the Si substrate even at room temperature, creating a metal-rich silicide. Annealing the samples at 500°C for 30 s creates a monosilicide layer with a thickness of about 200 Å. The imaginary part of the resulting dielectric function of monosilicides shows metallic Drude behavior with two additional peaks at 1.5 eV and 4.5 eV due to interband electronic transitions. Our results will be compared to previous measurements and electronic structure calculations on NiSi and PtSi. In our results, absorption peaks broaden with increasing Pt content in the silicides, similar to our earlier results for Ni<sub>1-x</sub>Pt<sub>x</sub> metal alloys.

Lina Abdallah  
New Mexico State University

Date submitted: 20 Sep 2013

Electronic form version 1.4