

# Study of carbon ions interactions with mono-crystalline silicon targets

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## Abstract

In this work, we studied the carbon ions interaction with mono-crystalline silicon, by simulation and experimentally. The case of Si(100) was particularly taken into account. Several phenomena related to carbon implantation were obtained by simulation using the code Crystal Trim. Experimentally, the samples were prepared by implanting carbon into silicon wafers with an implantation energy of 70 keV C<sup>+</sup> to fluences of  $1 \times 10^{16}$  C<sup>+</sup> cm<sup>-2</sup> and  $1 \times 10^{17}$  C<sup>+</sup> cm<sup>-2</sup> (for a tilt angle of 7°). The implanted wafers were annealed at different temperatures (875 °C, 1000 °C and 1250 °C). The characterization of the samples was performed using Raman spectroscopy technique. The analysis was very useful to study the damage and recrystallization of implanted targets. We also studied the effect of thermal annealing on the restoration of defects.

**Key words:** Carbon-Silicon interaction; Simulation; Raman