CALIBRATION OF THE "AU-LABELING" METHOD TO MEASURE EXCESS VACANCY PROFILES IN MeV-IMPLANTED Si.

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It has been shown recently[1] that "Au labeling" can be used to qualitatively profile the excess vacancy defects in the $1/2R_p$ region of MeV self-implants in Si. The technique is based upon the presumption that the concentration of trapped Au is proportional to the excess vacancy concentration. Using controlled injection of known doses of interstitials into prepared vacancy profiles, we provide direct evidence that the trapped Au concentration is indeed proportional to the vacancy concentration. Furthermore, the change in the trapped Au concentration as a function of the injected interstitials enables us to obtain the "calibration factor", representing the ratio of vacancies to trapped Au. The results of this work clearly show that the "Au profiling" technique provides a convenient way to quantify the excess vacancy profiles. Based on the calibration experiments, the reliability and sensitivity of this technique will be discussed.

[1] V.C.Venezia et al, App. Phys. Lett. 73, 2980 (1998)

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