

## Positron annihilation in bulk materials by using 17 MeV gamma beam induced positron beam

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We have developed a simple fast positron beam apparatus on the specialized high energy gamma beamline at synchrotron radiation facility "NewSUBARU" in Hyogo prefecture, Japan. This fast positron beam is created from quasi-monochromatic 17 MeV gamma beam directly via pair-creation in a Pb target and energy selection by applying of a magnetic field. By using this apparatus, we have successfully measured the defects and open volume in some bulk materials [1,2]. However, the depth profile of this fast positron annihilation is not well studied. In this study, fast positron annihilation Doppler broadening profiles for stacked iron and silicon plates with various stacking order each other were measured by using this positron beam. From these data, fast positron penetration and annihilation depth profile were estimated. The results of the Doppler profile of fast positron implanted into bulk iron have a good correlation with those of Monte Carlo simulation by PENELOPE code [3].

### References

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