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Study of titanium coating of multipole injection kicker by magnetron sputtering method

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One of the projects for upgrading at the Taiwan Photon Source (TPS) is the design and fabrication of an improved multipole injection kicker (MIK). The aim is to improve the injection efficiency using four kickers, to deliver transparent injections during the top-up operation. A uniform titanium coating on the inner surface of the ceramic substrate is required to reduce the impedance of the stored electron beam and to conduct the image current. The study results of the deposition of a titanium film on a ceramic substrate (30 cm × 6 cm) in a long vacuum chamber show that the thickness uniformity of the thin film can be controlled within 5% with an electrical resistivity of 2×10^{-4} ohm-cm. The adhesion between the ceramic substrate and the titanium film meet the highest ASTM-D3359 5B requirements (bonding strength 39.2 MPa). The details of the coating set-up, experimental processes and measurement method are described in this paper.

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Footnotes

Multipole injection kicker, Titanium Coating

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