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Electron beam focusing in the magnetic field of a bent electron beam evaporator

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Abstract

In this paper, the vacuum film deposition through electron beam evaporation has been reviewed and the effect of magnetic field on the operation of this system has been explained. Then, the magnetic field distribution due to magnetic components configuration of a commercial evaporation source with 270-degree electron beam gun (manufactured by Sharif University Branch of ACECR), has been simulated by means of a finite element software, ANSYS. The simulation result was verified by comparing with the results obtained from measurement by Hall Effect sensor. Furthermore, by using the ray-tracing capability of the software, the capability of the magnetic lens of this device for electron beam focusing has been investigated. The predicted position of the electron beam spot on the target is in good agreement with experimental observations.

Keywords: electron beam, magnetic lens, vacuum deposition

For full article, refer to the Persian section