

## Toward making first Iranian Photomultiplier tube

In this work a new method has been delivered to measure absorption coefficient and photoelectron multiplication of a photomultiplier dynode. Moving path of electrons toward first dynode was conducted by using of electrostatic lenses. Also by Poisson Super Fish simulation code, path of electrons toward dynode was discovered and by using of this simulation and calculation of focal point, location of dynode was recognized. Absorption and multiplication coefficients of first and second dynodes were theoretically predicted and experimentally measured. Results show multiplication coefficient is 0.5 for this selected dynode that with experienced results has a good agreement. The PMT gain is related to several factors. In this research, MgO is selected as dynode coating. Optimum thickness for coating of dynodes was calculated 9nm with casino code. Some primitive dynodes with predicted shape were constructed. One important part of PMT complex is, its photocathode. The CsI photocathode thickness is estimated by CASINO simulation code. The CsI thickness obtained for transmission-mode between 8 -19 nm and for reflection-mode equal to 27nm. After these prediction efforts, some type of CsI reflective-mode of photo cathodes was made and tried to measure their behaviors.

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