AbstractID: 8568 Title: The development of eye fixation software for the proton therapy of eye tumors

Purpose: Proton therapy is suggested as a next generation radiation therapy with their great dose localization performance compared with linear accelerator. Although proton therapy is recommended for eye melanoma treatment due to its excellence in dose localization, the patient positioning system (PPS) is essential since small error in PPS may cause significant damage to the patient. In this study, we developed an automatic real time eyeball tracking system for the treatment of eye melanoma

Method and Materials: A new automatic eye tracking system was developed using Labview 8.2 software with GUI based development tool (National Instrument), Vision development tool and image acquisition board(National Instrument). The real time image for eye movement was taken using CCD camera, which was transferred to the homemade image analysis program. Using computer outside the treatment room, a real time eye ball tracking based on image pattern matching method was realized by comparing a treatment template image used in the treatment planning with a real time image acquired from CCD camera.

Results: Based on the real time image analysis system, we achieved the real time eye ball tracking system with a resolution less than 0.01mm for the eye ball movement which will be used for the treatment of ocular tumor in proton therapy.

Conclusion: New automatic eye tracking system has been developed for ocular tumor treatment which is going to be used in the clinical trial with the gating system.

Key words: Eye tracking system, Proton therapy, Ocular, Eye treatment,