

Performance of a Respiration-Gated Beam Control System for Patient Treatment, N. ARAKI,

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S. YAMADA, NIRS - A beam control system for

irradiation treatment gated by respiration of a patient

has been developed at HIMAC in order to minimize an

unwanted dose to normal tissues around tumour. The

system employs (1) rf-knockout extraction that can

respond to a respiration signal quickly, (2) a 0.3 Hz,

50% duty operation for beam extraction of synchrotron

that maximizes dose rate, and (3) a beam deceleration

as a beam aborting system. In preliminary

experiments, an irradiation gated by a simulating signal

of respiration was successfully achieved. The

penumbra size was considerably reduced to 30%

compared with that of ungated irradiation. Based on

the preliminary experiment, the treatment using the

beam that is gated by respiration of a patient will be

started from next April, '96. The paper describes the

performance of the system.