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Structure sparsity of the spot optimization in proton arc therapy

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Structure sparsity of the spot optimization in proton arc therapy

Lewei Zhao

Beaumont Health System

12:35 pm, PSM2, Breakout Room 2

Radiation therapy is one of the main cancer treatments that uses radiation to kill cancer cells. Proton therapy, or proton radiotherapy, is a type of particle therapy that uses a beam of protons to irradiate tumor volume. Beaumont proton therapy center research group invented the first robust and delivery-efficient spot-scanning proton arc (SPArc) therapy in 2016. Based on our beam modeling platform, we have found that the spot switching time (SSWT) occupies most of the treatment delivery time using the IBA ProtetusONE machine, and SSWT is proportional to spot numbers. We aim to develop a direct mathematical optimization method to reduce the spot numbers for SPArc based on an independent optimization platform that will pave the roadmap of the proton arc therapy's multicriteria optimization.
