Docket #: S08-282

Configurations for integrated MRI-linear accelerators

Stanford researchers have developed an integrated MRI-Linac hybrid system that can increase the efficacy of image-guided radiotherapy (IGRT). This system allows more aggressive treatment strategies that employ dose escalation, tighter geometric margins and sharper dose gradients which can improve clinical outcomes. This radiotherapy treatment apparatus includes a treatment beam (charged by Linac, particle, proton, or electron beam), a magnetic field disposed parallel collinear to the treatment beam, and a target that is disposed along the treatment beam. MRI is ideal for IGRT, however, there is magnetic field and RF interference between the linear accelerator and MRI scanner. The configurations of this system overcome this issue.

Applications

- **Image-guided radiotherapy (IGRT)**

Advantages

- Increases efficacy of image-guided radiotherapy (IGRT)
- Can significantly improve patient outcomes
- Overcomes the interference of magnetic field and RF interference between the linear accelerator and MRI scanner
- Helps manage the intrafraction motion during radiation treatment of thoracic and abdominal cancers
- Can allow more aggressive treatment strategies that employ dose escalation, tighter geometric margins and sharper dose gradients which can improve clinical outcomes

- No current commercial method capable of directly visualizing a soft-tissue volume such as a prostate tumor or lung nodule during dose delivery
- Can be applied, with minimal modifications, to improve dose delivery using super-high energy protons

Patents

- Published Application: 20100239066

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