

Abstract Submitted
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Can we use the equivalent sphere model to approximate organ doses in space radiation environments? ZI-WEI LIN, East Carolina University — For space radiation protection it is often useful to calculate dose or dose equivalent in blood forming organs (BFO). It has been customary to use a 5cm equivalent sphere to approximate the BFO dose. However, many previous studies have concluded that a 5cm sphere gives very different dose values from the exact BFO values. A study by Bier, Townsend and Maxson (*Adv. Space Res.* 21, 1998) concludes that a 9cm sphere is a reasonable approximation for BFO doses in solar particle event environments. In this study we use a deterministic radiation transport to investigate the reason behind these observations and to extend earlier studies. We take different space radiation environments, including solar particle events and galactic cosmic rays at different solar modulation, and calculate the dose and dose equivalent in the skin, eye and BFO using their thickness distribution functions from the Computerized Anatomical Man model. We then determine in which cases and at what radius parameters the equivalent sphere model is a reasonable approximation.

Zi-Wei Lin
East Carolina University

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