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Article

Supplemental Information for

Design and Computational Validation of γ-Ray Shielding Effectiveness in Heavy Metal/Rare Earth Oxide-Natural Rubber Composites

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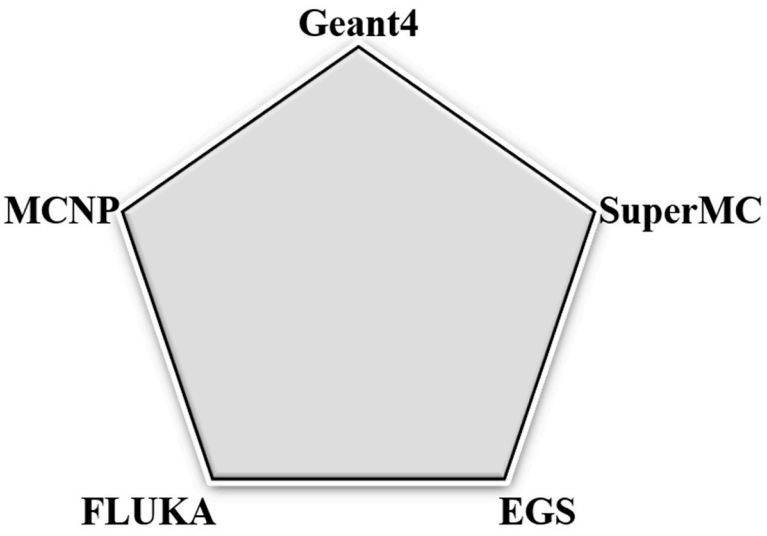


Figure S1. Commonly used radiation simulation software

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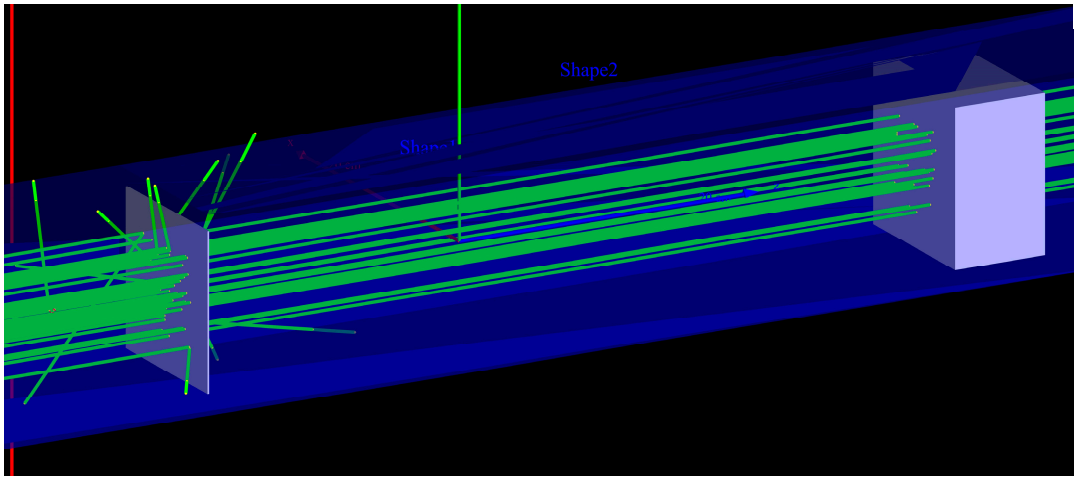


Figure S2. 3D shielding test model built by Geant4

```
G4ThreeVector pos1 = G4ThreeVector(0, 0,-4.8*cm);
G4double material_dxa=10*cm, material_dxb=10*cm;
G4double material_dya=10*cm, material_dyb=10*cm;
G4double material_dz=10*cm;
G4Material*C5H8CTa2O5ZnO=new G4Material("CHCTaZn", 2.172*g/cm3,ncomponents=5);
C5H8CTa2O5ZnO ->AddElement(C,fractionmass=37.2*perCent);
C5H8CTa2O5ZnO ->AddElement(O,fractionmass=10.8*perCent);
C5H8CTa2O5ZnO ->AddElement(H,fractionmass=3.40*perCent);
C5H8CTa2O5ZnO ->AddElement(Zn,fractionmass=1.10*perCent);
C5H8CTa2O5ZnO ->AddElement(Ta,fractionmass=47.5*perCent);
```

Figure S3. Method of defining shield geometry and material in Geant4

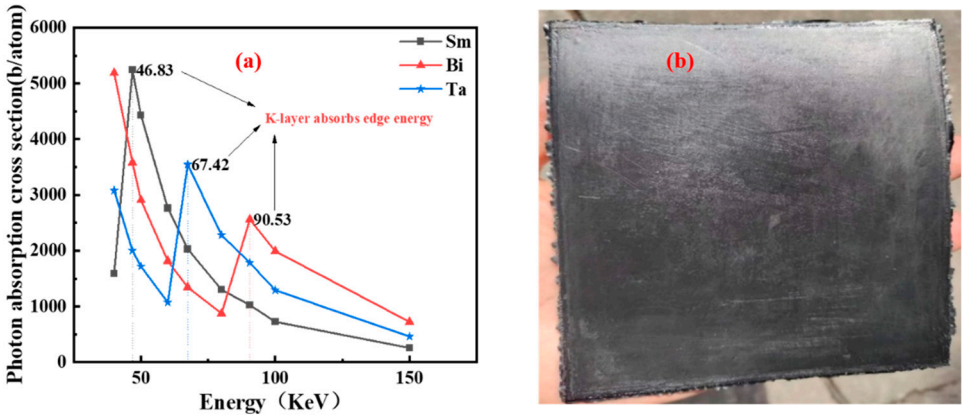


Figure S4. (a) K-Layer absorption edge values of shielding elements in composite materials (b) Experimentally prepared composite rubber