Supporting information

Terbium Doping $LiYbF_4$ Nanomaterial-based Scintillator Responding to X-ray with Application of High-resolution Imaging

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Fig. S1: Partial TEM image of $LiYbF_4$:15%Tb NCs, and the crystal quality is good without defects

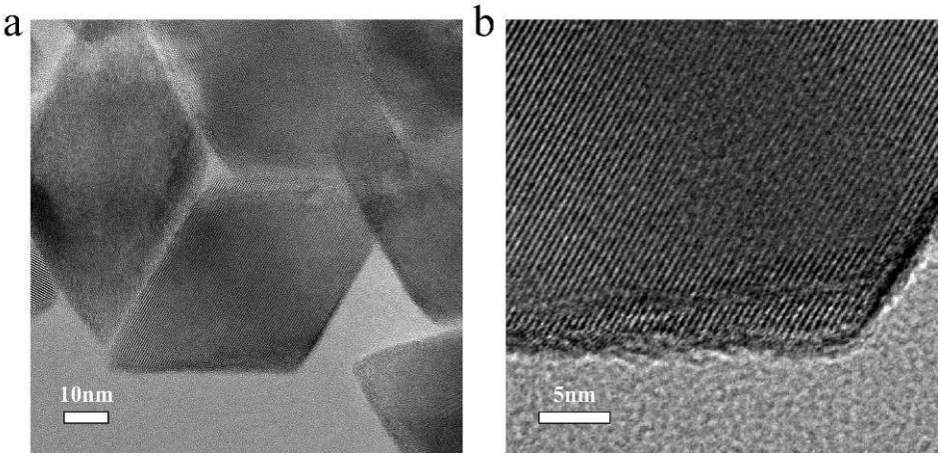

Fig. S2: The fluorescence emission spectrum and excitation spectrum of $LiYbF_4$:15%Tb NCs

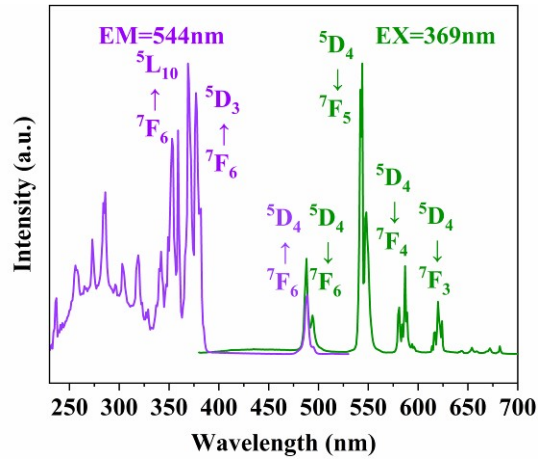

Fig. S3: The energy level transition process of Tb^{3+}

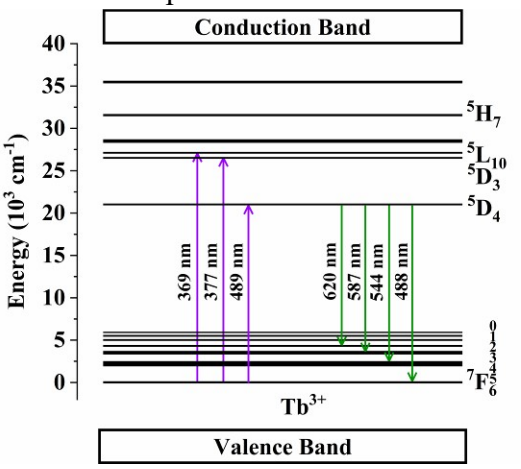

Fig. S4: The radioluminescence spectra of $LiYbF_4$:15%Tb NCs (a) and BGO (b) at a voltage of 50kV and a dose rate of 8.197mGy/s～42.29mGy/s

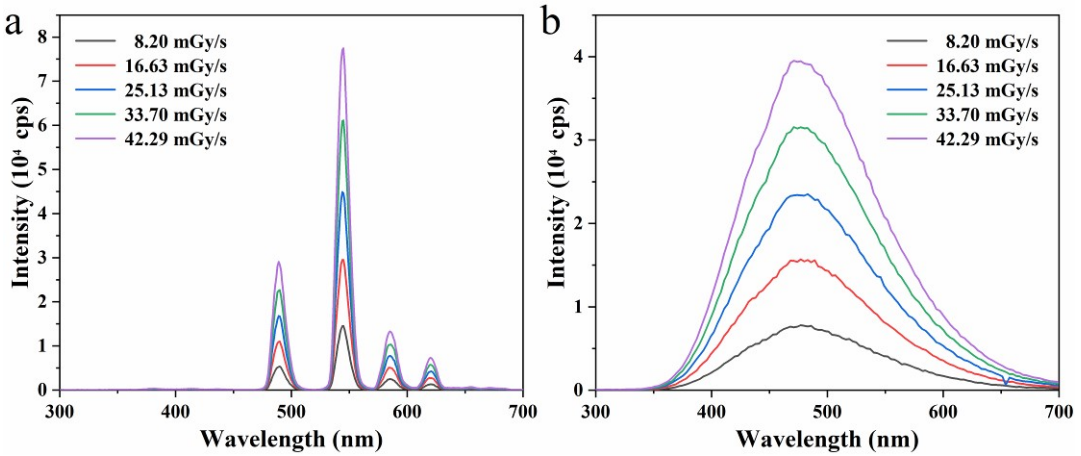

Fig. S5: The XEL of $LiYbF_4$:15%Tb NCs (a), $CsPbBr_3$ (b) and BGO (c)

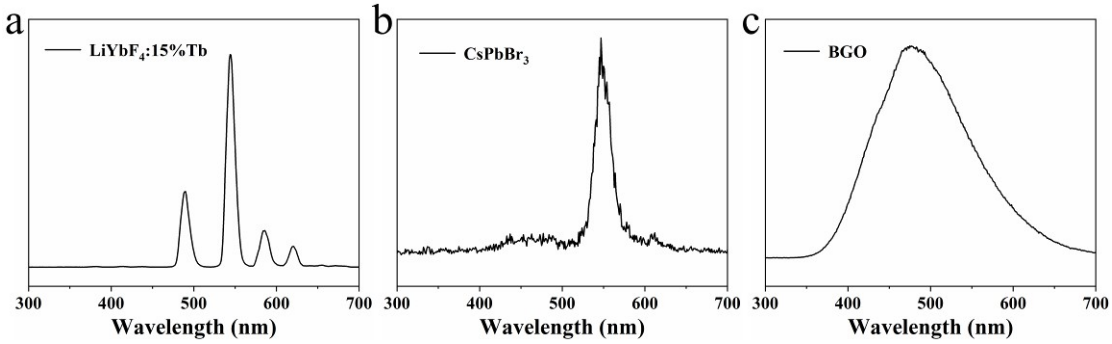

Fig. S6: The TG curve of $LiYbF_4$:15%Tb NCs ranges from 30-1200°C

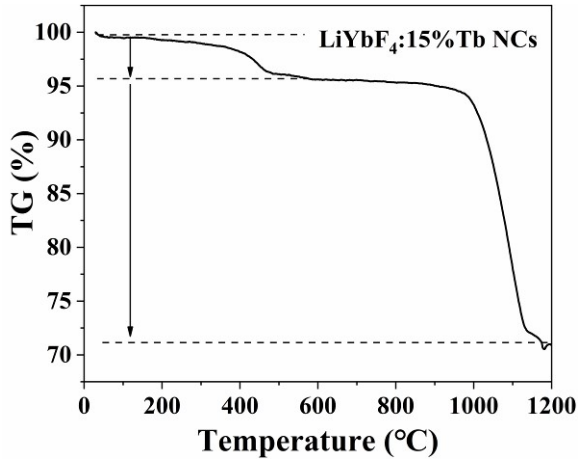

Fig. S7: The changes in the XEL of $LiYbF_4$:15%Tb NCs after 172 days in the air

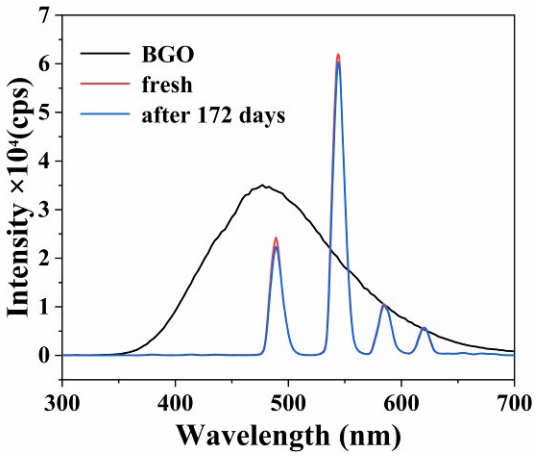

Fig. S8: The physical image of 40wt% $LiYbF_4$:15%Tb scintillation film

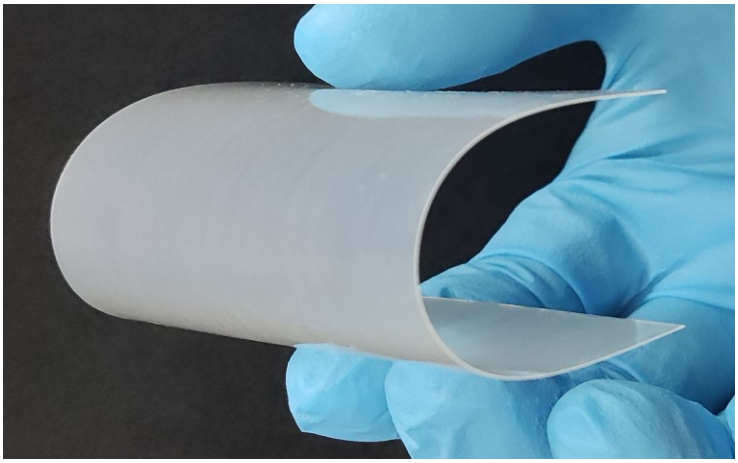

Fig. S9: The radioluminescence spectra of $LiYbF_4$:15%Tb NCs and $LiYbF_4$:15%Tb scintillation films at a dose rate of 42.29mGy/s and a voltage of 50kV

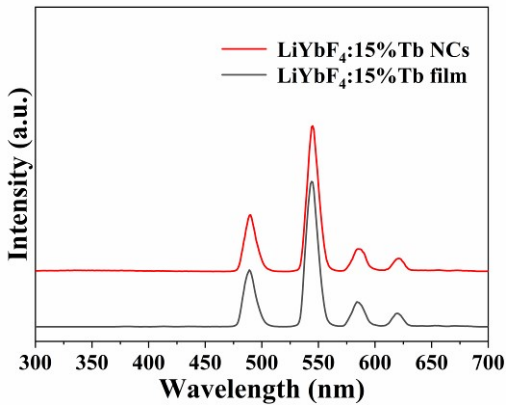

Fig. S10: Physical picture of 0wt%, 10wt%, 20wt%, 30wt%, 40wt% and 50wt% load

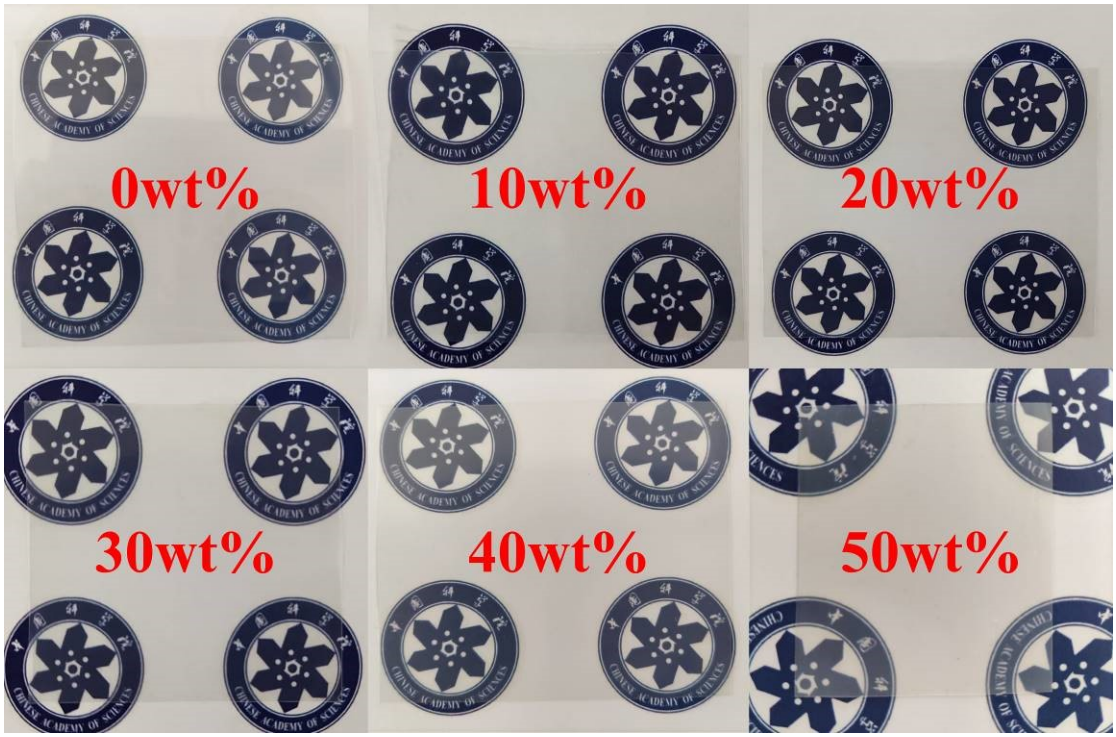

Fig. S11: The physical image of 50wt% $LiYbF_4$:15%Tb scintillation film under natural light (left) and X-ray (right)

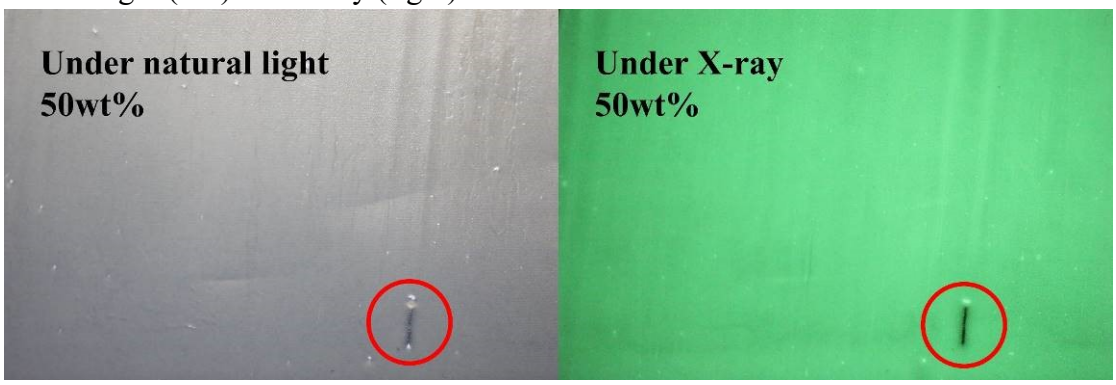

Fig. S12: The stability of the $LiYbF_4$:15%Tb scintillation film at a dose rate of 12.4mGy/s for 2700s

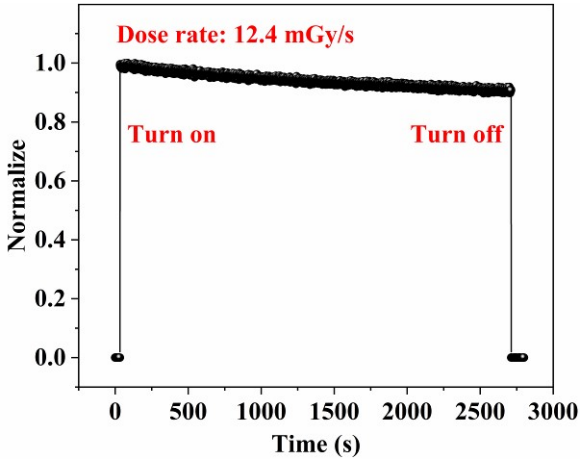

Fig. S13: X-ray imaging system

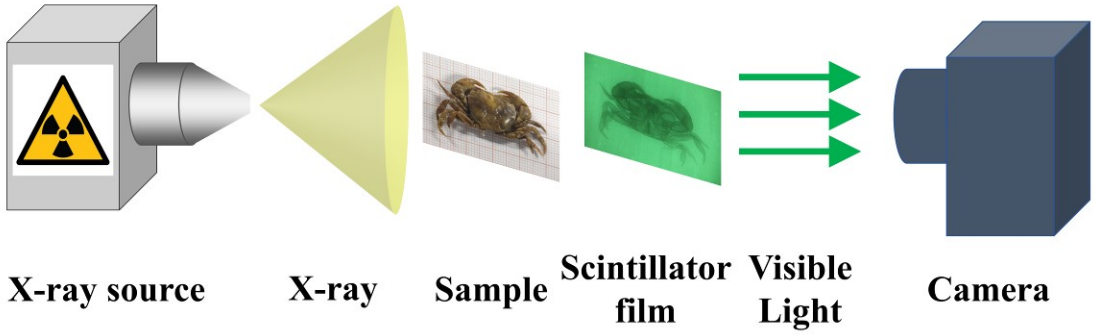

Fig. S14: BGO scintillation film under natural light (left) and X-ray (right)

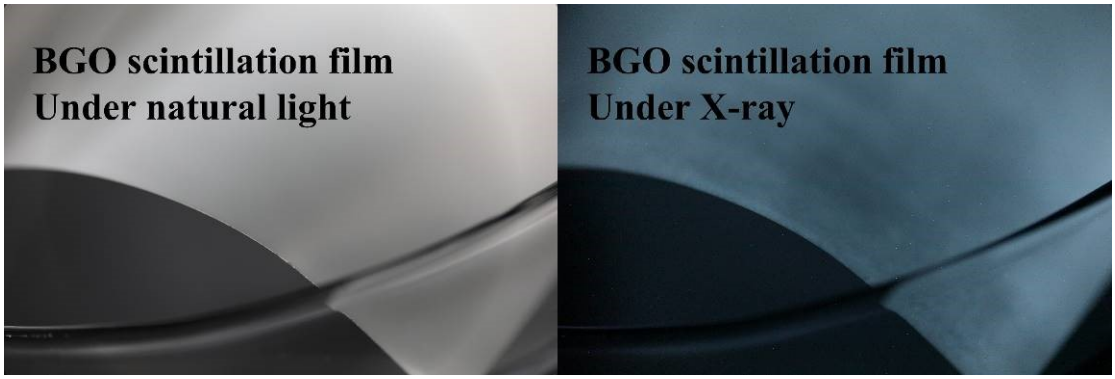

Fig. S15: The grayscale image at 10-20LP/mm of $LiYbF_4$:15%Tb scintillation film

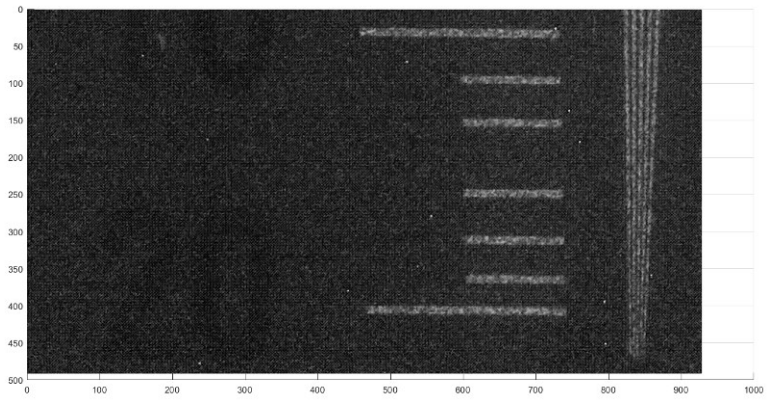

Fig. S16: The grayscale image at 3-10LP/mm of BGO scintillation film

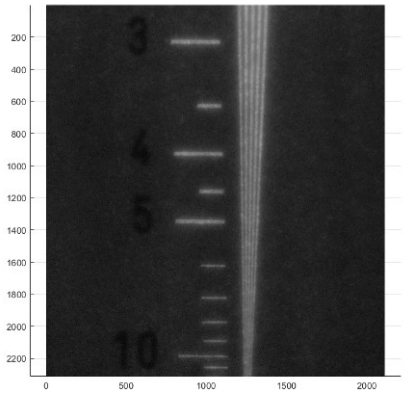

Fig. S17: The stripe brightness extraction map of $LiYbF_4$:15%Tb scintillation film at

14-20LP/mm. Each peak corresponds to a bright fringe and a trough corresponds to a dark fringe

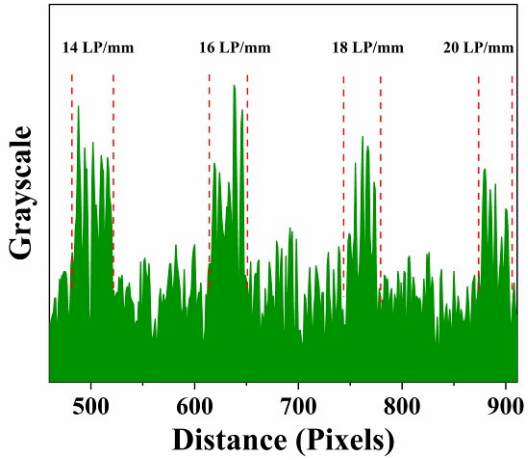

Fig. S18: The stripe brightness extraction map of BGO scintillation film at 4.5-8LP/mm

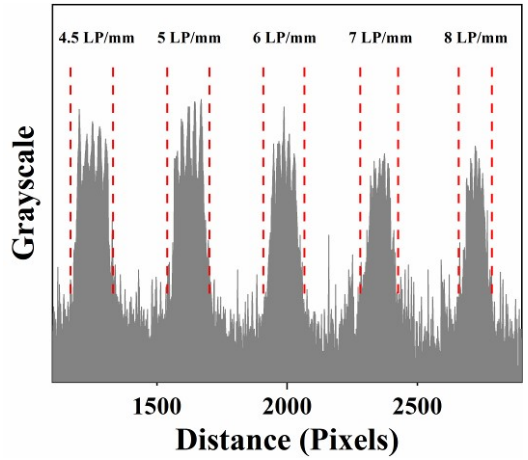

Fig. S19: The X-ray imaging of the data line at a dose rate of 42.29mGy/s and a voltage of 50kV. Metal and plastic are clearly distinguishable in the X-ray image