Electronic Supplementary Material (ESI) for Inorganic Chemistry Frontiers.

Temperature-sensing luminescent materials $La_{9.67}Si_6O_{26.5}$:Yb^{3+}-Er^{3+}/Ho^{3+} based on pump-power-dependent upconversion luminescence

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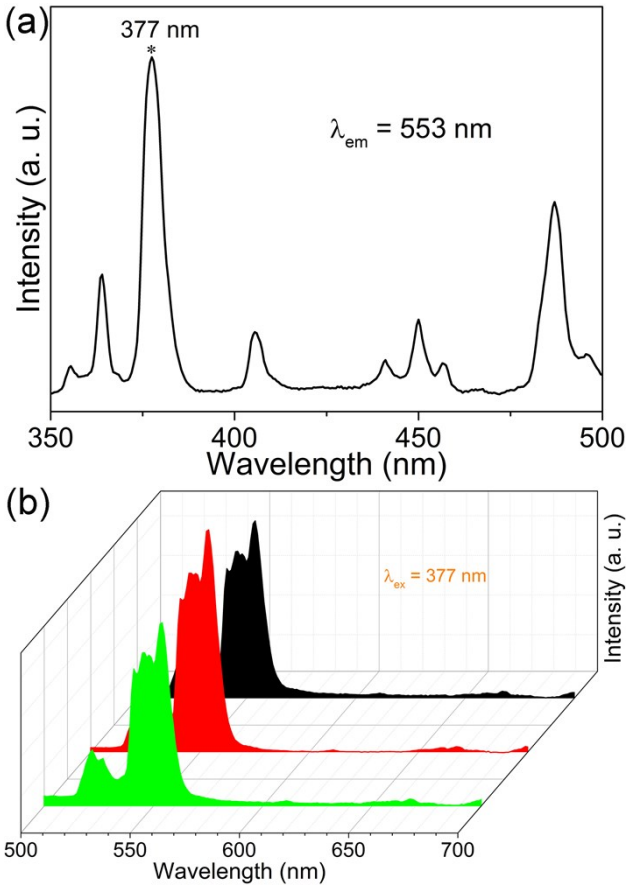

Figure S1 (a) Excitation spectrum of LSO:10%Yb^{3+},1%Er^{3+} monitored by 553 nm; (b) emission spectra of LSO:10%Yb^{3+},xHo^{3+} (1% ≤ x ≤ 3%) upon 377 nm excitation

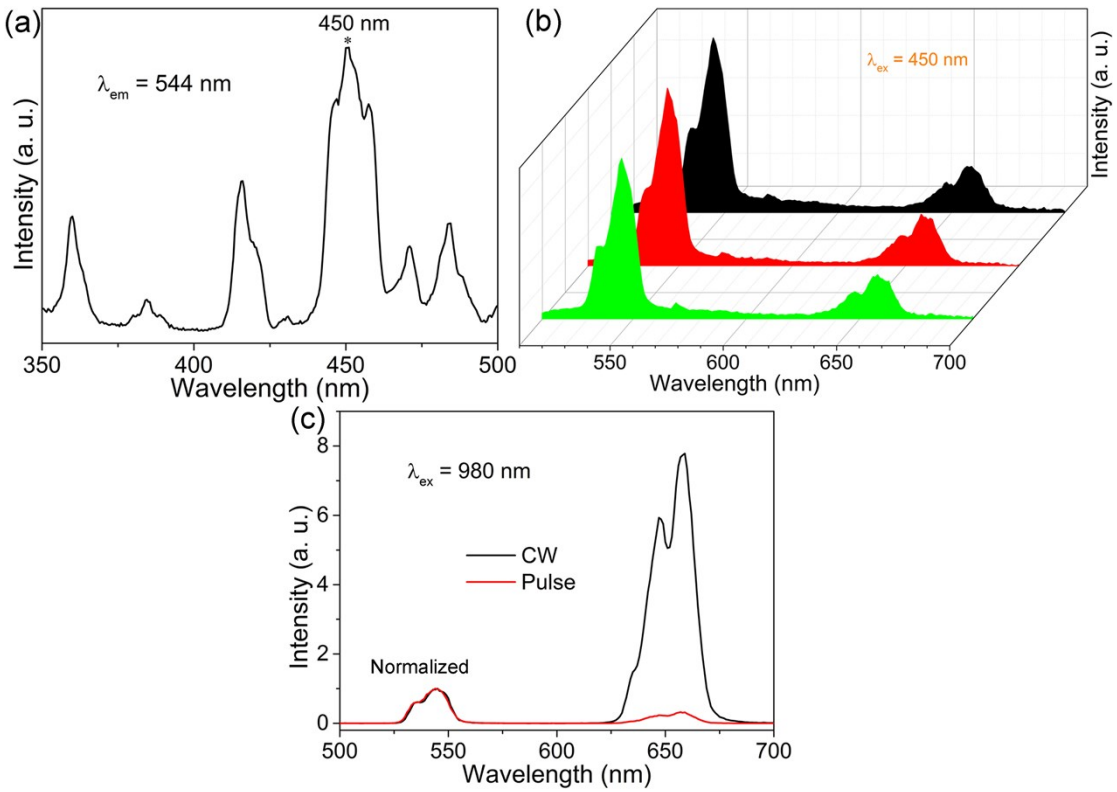

Figure S2 (a) Excitation spectrum of LSO:10%Yb^{3+},1%Ho^{3+} monitored by 544 nm; (b) emission spectra of LSO:10%Yb^{3+},yHo^{3+} (1% ≤ y ≤ 3%) upon 450 nm excitation; (c) normalized (for 544 nm) emission spectra of LSO:10%Yb^{3+},1%Ho^{3+} excited by CW and pulse light source of 980 nm

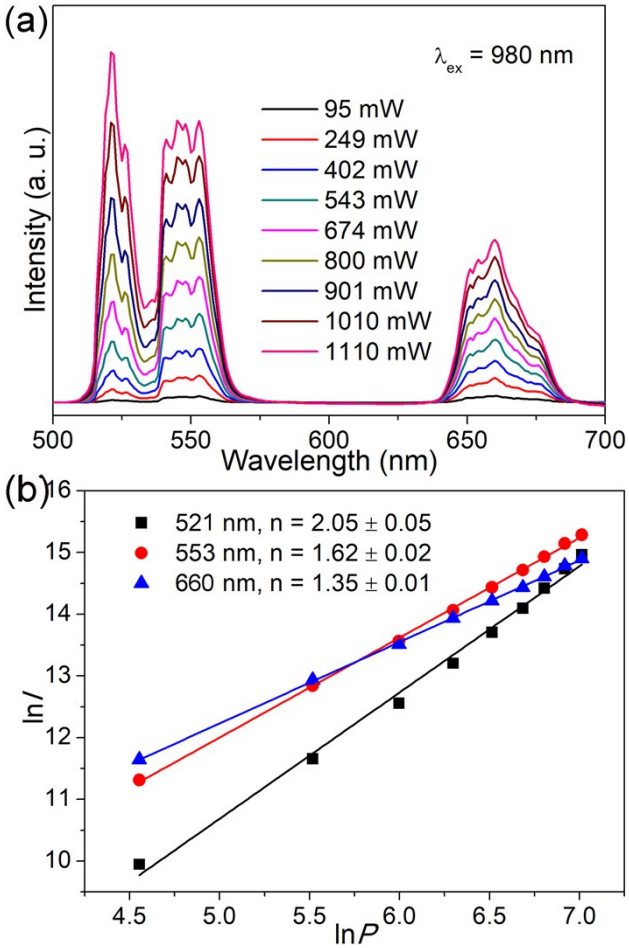

Figure S3 Emission spectra of LSO:10%Yb^{3+},1%Er^{3+} excited at 980 nm excitation under various pump powers; (b) dependences of ln*I* for 522, 553 and 657 nm emissions of Er^{3+}on ln*P*

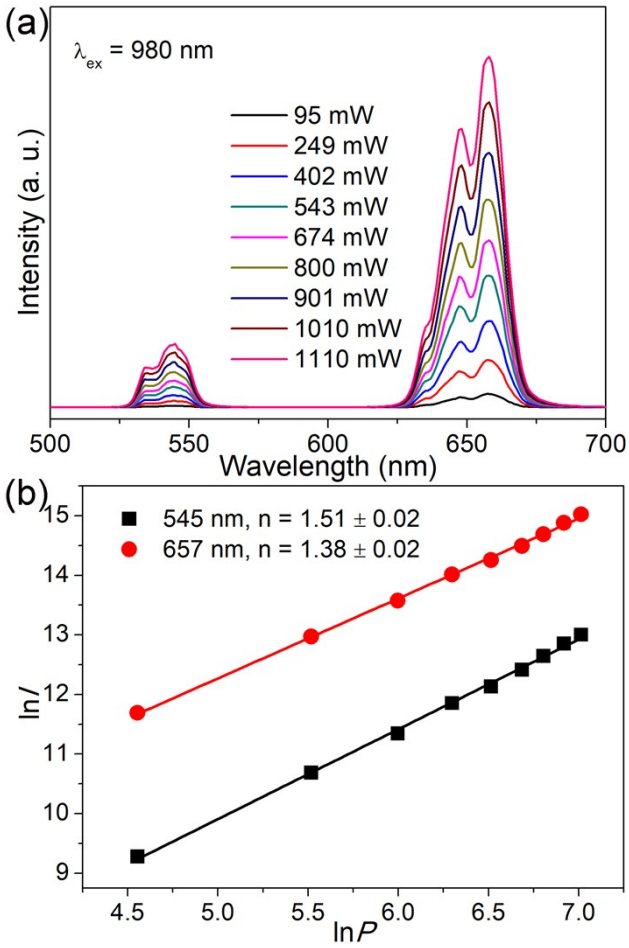

Figure S4 Emission spectra of LSO:10%Yb^{3+},1%Ho^{3+} excited at 980 nm excitation under various pump powers; (b) dependences of ln*I* for 545 and 657 nm emissions of Ho^{3+} on ln*P*

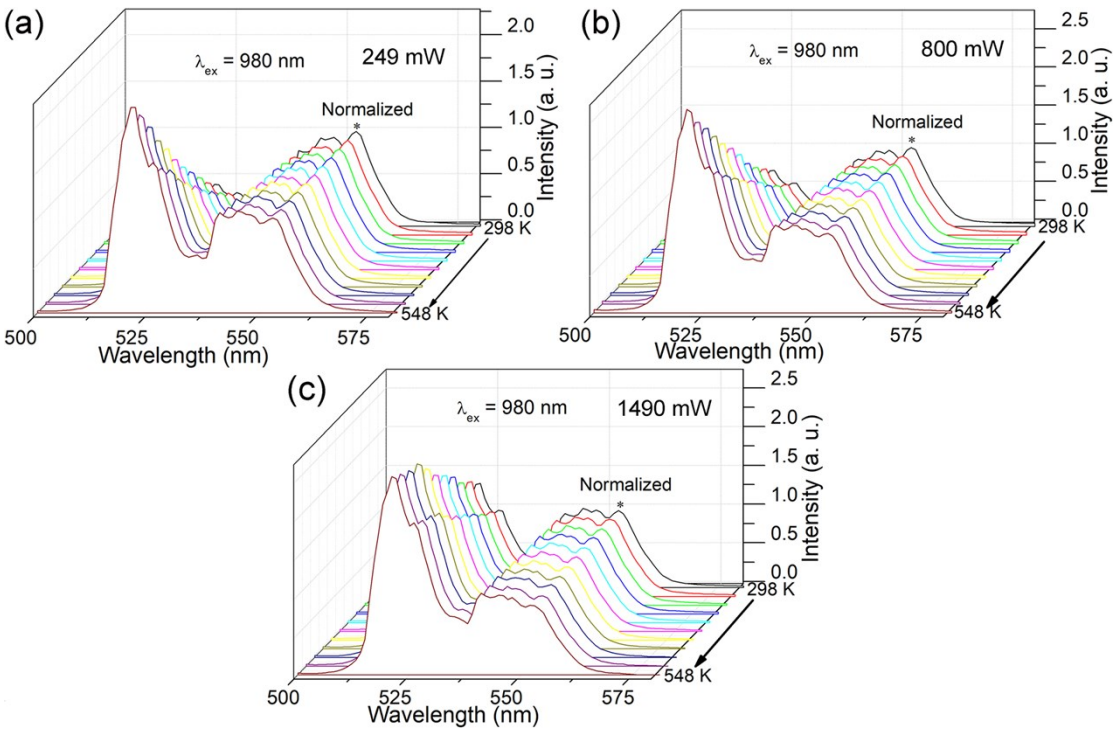

Figure S5 Normalized emission spectra of LSO:10%Yb^{3+},1%Er^{3+} excited under various temperatures for the pump power of (a) 249 mW, (b) 800 mW and (c) 1490 mW

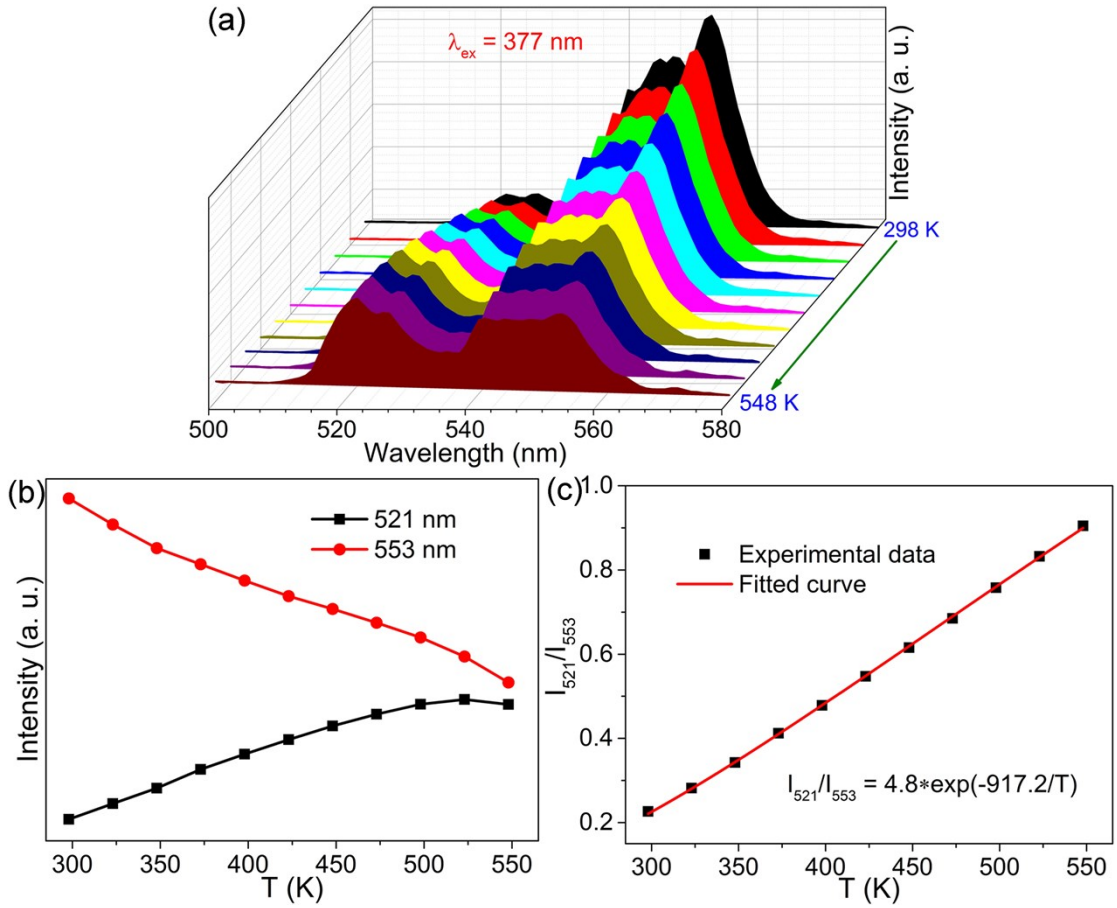

Figure S6 (a) Emission spectra of LSO:10%Yb^{3+},1%Er^{3+} excited at 377 nm under various temperatures; (b) relative intensities of 521 and 553 nm emissions of Er^{3+} as a function of temperature; (c) dependence of I_{521}/I_{553} on absolute temperature

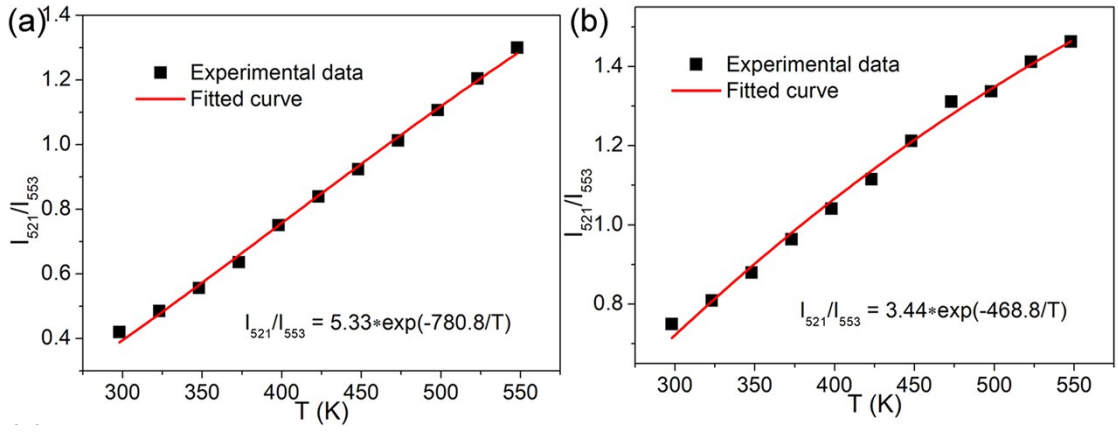

Figure S7 Dependences of I_{521}/I_{553} on absolute temperature for LSO:10%Yb^{3+},1%Er^{3+} excited under the pump power of (a) 800 mW and (b) 1490 mW

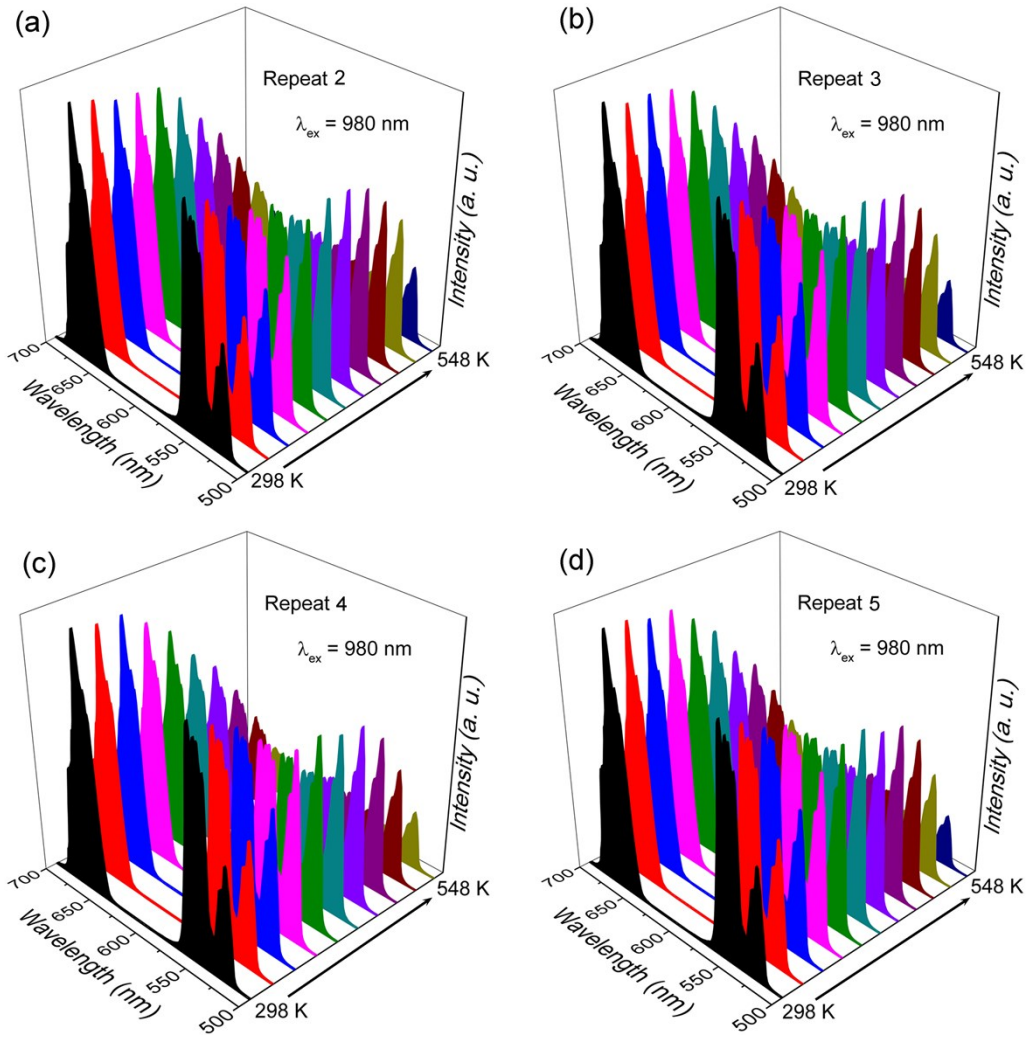

Figure S8 Emission spectra of LSO:10%Yb^{3+},1%Er^{3+} by repeating the measurement excited by 980 nm of 249 mW under various temperatures

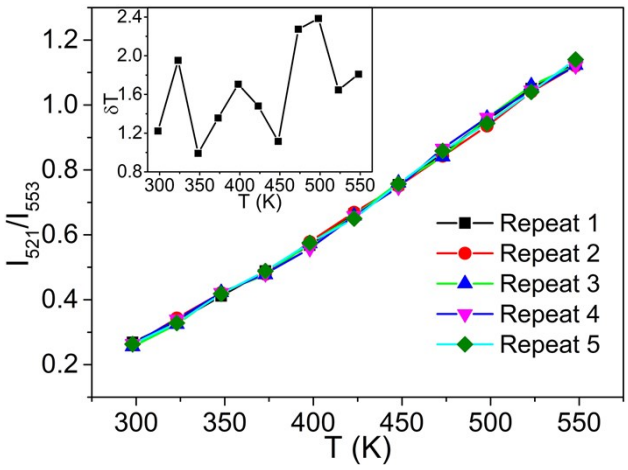

Figure S9 Dependences of I_{521}/I_{553} on absolute temperature for repeating measurement, inset shows the δT value as a function of temperature

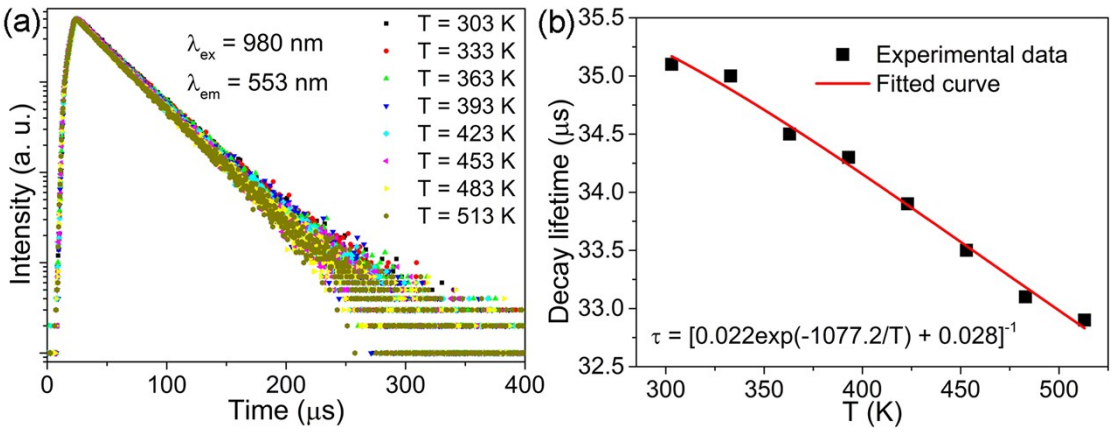

Figure S10 (a) Decay curves of LSO:10%Yb^{3+},1%Er^{3+} excited at 980 nm and monitored at 553 nm; (b) dependence of decay lifetime on temperature