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Supporting Information

Heating-induced Abnormal Increase of Yb^{3+} Excited State Lifetime and Its Potential Application in Lifetime Luminescence Nanothermometry

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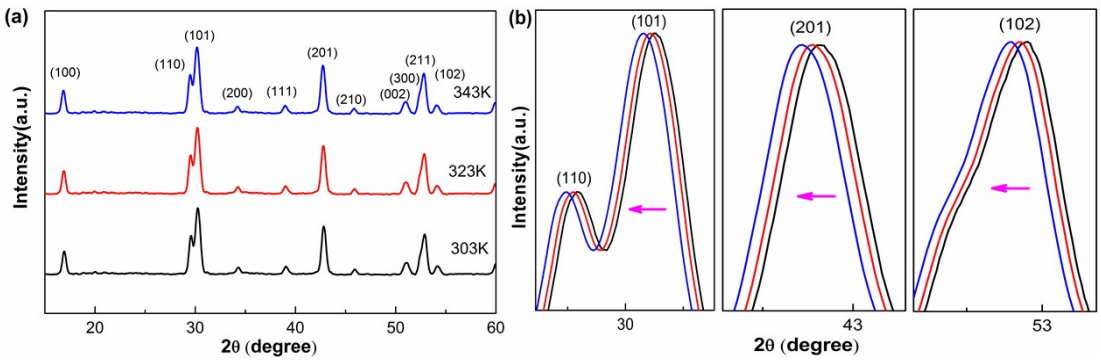

Fig. S1. (a) Temperature-dependent XRD patterns of NaGdF4:Yb3+/Nd3+ (20/1 mol %) sample, and (b) local amplification of the peaks indexed by (110), (201) and (102), respectively.

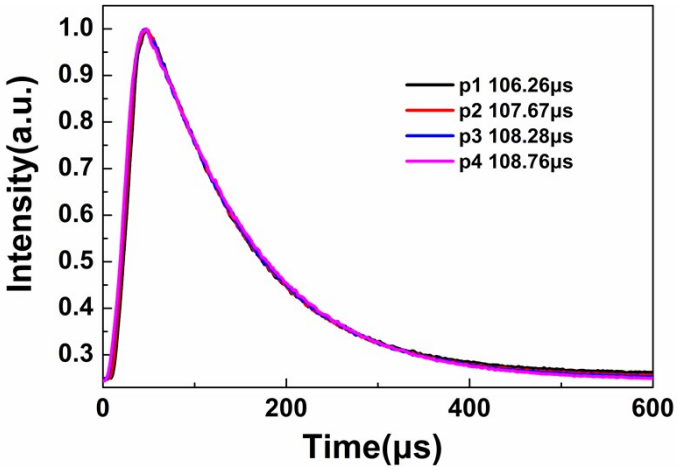

Fig. S2. Excitation power dependent fluorescence decay curve of the Yb^{3+} emission at room temperature.

To prove the insensitivity of the lifetime for Yb^{3+} emission on the excitation power, we performed the excitation-dependent lifetime measurements, as shown in the Fig.S2. Four different laser excitation powers were applied, with P1\P2\P3\P4 corresponding to 0.06W\0.55W\1.01W\1.42W, respectively. The calculated lifetime increases very slightly with the elevated excitation power. Although the luminescence lifetime is indeed excitation power dependent, the influence is tiny within the above-mentioned power region. Therefore, in our opinion, the luminescence lifetime for the present case can be regarded as insensitive to excitation power variation within the applied excitation power region.