Enlargement of the organic solid-state DFB laser wavelength tuning range by the use of two complementary luminescent dyes doped into the host matrix

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Electronic Supplementary Information (ESI)

ESI contains additional data excluded from the main article. Presented figures and tables support details but are not essential for understanding of the paper.

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- 1. Figure S1 Luminescence decay curves of DCNP crystals for selected dye-doped polymers measured at room temperature.
- 2. Figure S2 Deconvolution of biexponential DCNP crystal luminescence decay into two components as a function of relative A/D weight ratios in the samples.
- 3. Table S1 Relative amplitudes of biexponential DCNP crystal luminescence decay time constants for studied samples.
- 4. Table S2 pumping light energy densities for the STE spectra shown in Fig. 4 of the main article.



Fig. S1. Normalized luminescence decay curves for selected samples containing DCNP crystals and different amounts of Rh700 dye, monitored at the wavelength of $\lambda_{em} = 600$ nm. Instrument response function (IRF) is marked in black.



Fig. S2. Two components of DCNP crystal luminescence lifetime, τ_1 and τ_2 (red squares and blue circles, respectively), measured at the wavelength of $\lambda_{em} = 600$ nm for different relative A/D weight ratios in the samples. Stacked bars represent relative amplitudes of the luminescence signals associated with respective time constants for each sample.

constants, τ_1 and	τ_2 , for different relat	ive A/D weight ratios	in the studied material	s, corresponding
to the Fig. S2.				
	Rh700/DCNP	Amplitude of τ_1	Amplitude of τ_2	

Tab. S1. Relative amplitudes A_1 and A_2 of luminescence signal associated with decay time

	I	T
w/w ratio	A_1 [%]	A_2 [%]
1.0	87	13
0.75	85	15
0.5	84	16
0.25	76	24
0.15	86	14
0.1	88	12
7.5×10 ⁻²	89	11
5.0×10 ⁻²	87	13
2.5×10 ⁻²	86	14
0 (DCNP)	88	12

Tab. S2. Energy densities of $\lambda_{pump} = 532$ nm pulsed Nd:YAG pumping light for excitation of STE, for the spectra presented in Fig. 4 of the main article.

Rh700/DCNP	Energy density of pumping beam
w/w ratio	$ ho_{pump} \ [mJ/cm^2]$
1.0	5.5
0.75	5.5
0.5	5.5
0.25	3.8
0.15	19.1
0.1	5.5
7.5×10 ⁻²	5.5
5.0×10 ⁻²	3.8
2.5×10 ⁻²	5.5
0 (DCNP)	3.8