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Biphoton Generation Driven by Spatial Light Modulation: Parallel-to-Series Conversion LUWEI ZHAO, XIANXIN GUO, YUAN SUN, YUMIAN SU, M. M. T. LOY, SHENGWANG DU, Hong Kong Univ of Sci Tech — We demonstrate the generation of narrowband biphotons with controllable temporal waveform by spontaneous four-wave mixing in cold atoms. In the group-delay regime, we study the dependence of the biphoton temporal waveform on the spatial profile of the pump laser beam. By using a spatial light modulator, we manipulate the spatial profile of the pump laser and map it onto the two-photon entangled temporal wave function. This parallel-to-series conversion (or spatial-to-temporal mapping) enables coding the parallel classical information of the pump spatial profile to the sequential temporal waveform of the biphoton quantum state. The work was supported by the Hong Kong RGC (Project No. 601113).

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