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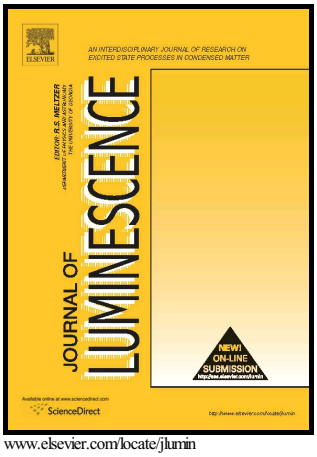

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Investigating the evolution of exciplex states in thermally activated delayed fluorescence organic light-emitting diodes by transient measurement

Qingyu Huang[a,b], Suling Zhao[a,b*], Peng Wang[a,b], Zilun Qin[a,b], Zheng Xu[a,b], Dandan Song[a,b], Bo Qiao[a,b], Xurong Xu[a,b]

[a]Key Laboratory of Luminescence and Optical Information (Beijing Jiaotong University), Ministry of Education, Beijing 100044, China

[b]Institute of Optoelectronics Technology, Beijing Jiaotong University, Beijing 100044, China

Email: slzhao@bjtu.edu.cn

***Corresponding Author.**

ABSTRACT

Exciplex states play a crucial role in governing the ultimate device performance, as both current density-voltage-luminescence characteristics and external quantum efficiency directly depend on it. For electron-hole evolution, exciplex states represent the intermediate but essential step between exciton recombination and dissociation. Therefore, the fundamental understanding of the processes involving the exciplex state is essential for utilizing such mediate state to achieve high emission efficiencies approaching the theoretical limits with simple structured organic light-emitting diodes (OLEDs). Herein, we systemically investigate the evolution of exciplex states using transient photoluminescence measurements compiling with transient electroluminescence measurements on high-performance exciplex type thermally activated delayed fluorescence (TADF) OLEDs. The dynamic properties of the long-lived fluorescent exciplex states upon both photo-excitation and electro-excitation offer in-depth insight to the fundamental mechanisms