

**Temporal-spatial context of NBEs with normal lightning events
revealed by VLF/LF observation system**
Intended for Lightning Physics

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Thousands of NBEs were detected during the multi-station VLF/LF observations of lightning experiment at Jianghuai Area, in East China, during four thunderstorms of the summer in 2012. All these NBEs and other normal lightning discharge events are automatically classified by a practicable method, which was validated by a comparison with manual classification. Statistical analysis were made based on five different groups of NBEs, such as isolated-NBEs, pre-NBEs, post-NBEs, middle-NBEs, and multi-NBEs, by considering all of the temporal intervals and spatial distances of NBEs and other normal lightning events. The results show that, among all these five groups, isolated-NBEs and pre-NBEs take up about 83.6%, which show quite big opportunity when an NBE occur, and 38.9% of all the NBEs occur in isolation. There is also a slight rate of occurrence (about 4.1%) of NBE accompanying with another NBE (or other NBEs) within a short time scale and local space, whose physical mechanism and the inner relations between them have not been paid close attention to. We suggest that the temporal and spatial context of NBEs revealed by VLF/LF observation system is indispensable to the previous study of NBEs.