

北京夏季夜间低空急流特征观测分析

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摘要 利用三年夏季系留气艇探测结果, 分析了北京夏季夜间低空急流的一般特征. 30%的夜间观测记录出现了低空急流. 急流平均高度为200 m, 其最大频率出现在140 m左右, 90%急流出现在320 m以下. W、SW、SE是夜间低空急流的主要风向. 不同观测地点低空急流在速度、风向和高度上存在明显差异. 城区低空急流高度大部分时间比郊区高. 个例分析表明, 在夜间稳定边界层条件下, 低空急流与局地山谷风环流强弱变化有很好相关. 进一步成因分析认为, 斜坡地形产生的热成风、山谷风环流可能是北京夏季夜间低空急流形成的主要原因.

关键词 [夜间低空急流](#), [稳定边界层](#), [系留气艇](#), [热成风](#), [山谷风](#)

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Observation and analysis of nocturnal low-level jet characteristics over Beijing in summer

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Abstract By using the data of tethered balloon sounding observed in summer for three years at three sites in Beijing, the properties of nocturnal low-level jet (NLLJ) were analyzed. NLLJs are present in 30% of nocturnal soundings, and the mean height of NLLJs is around 200 m. More than 90% of NLLJs have their wind speed maxima below 320 m. The wind direction of NLLJ is predominately from W, SW and SE during nighttime. Speeds, directions and heights of NLLJ are varied from different sites, in which jet heights at urban site is mostly bigger than that in suburban site. Case study shows a good relationship between evolution of NLLJ and diurnal variation of mountain and valley breezes in nocturnal stable boundary layer. Further analyses revealed that baroclinicity over sloping terrain and mountain-valley breezes are mainly potential causes of nocturnal NLLJ over Beijing during summer.

Key words [Nocturnal low-level jet](#) [Stable boundary layer](#) [Tethered balloon](#) [Thermal wind](#) [Mountain-valley wind](#)

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