地球物理学报 2003 46 (3): 317~321 ISSN: 0001-5733 CN: 11-2074/P

论文

用宽带干涉仪观测云内闪电通道双向传输的特征

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收稿日期 2002-1-8 修回日期 2002-12-23 网络版发布日期 接受日期

摘要 利用闪电宽带干涉仪系统对闪电的观测表明，地闪和云闪的云内闪电通道都存在双向发展的特征. 闪电在云中负电荷区域初始激发以后，在通道两端发生向不同方向同时发展的击穿过程. 这两种击穿过程均产生较强的辐射，且辐射频谱特征十分相似，表明云内闪电通道两端发生的击穿过程可能均为负击穿过程. 相应电场变化表明闪电通道双向发展期间伴随着负电荷的向上转移. 这一观测事实与Kasemir早期提出的闪电通道双向发展的概念有一定的差异.

关键词 闪电 先导 双向发展 雷电电磁辐射 宽带干涉仪

分类号

DOI:

BROADBAND INTERFEROMETER OBSERVATIONS OF THE BI-DIRECTIONAL BREAKDOWN PROCESS IN NATURAL LIGHTNING

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Received 2002-1-8 Revised 2002-12-23 Online Accepted

Abstract The bi directional propagations of a lightning channel within clouds have been observed for both the cloud to ground and cloud discharges by use of a lightning broadband interferometer system. After a lightning discharge is initiated within the negative charge region of clouds, its channel development shows bi directional propagations with two concurrent breakdown processes extending in opposite directions from the extremities of the lightning channel. Radiation field spectra of the two concurrent breakdown processes are quite similar, indicating that the processes may be negative breakdown and may be caused by the same mechanisms. During the bi directional propagations of the channel, the electric field change indicates that the negative charge moves upward along the channel. These results are dissimilar to the concept of bi directional, uncharged leader previously proposed by Kasemir.

Key words Lightning;Leader;Bi directional propagation;Lightning electromagnetic radiation;Broadband interferometer

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