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论文

空中人工引发雷电先导过程的特征分析

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摘要： 利用闪电电场变化仪对空中人工引发雷电引起的电场变化进行了两站同步观测，并结合高时间分辨率的光学观测资料的分析研究，揭示了一次空中引发雷电先导物理过程的特征. 当携带金属导线的火箭上升到几百米高度时，在金属导线的上端和下端激发产生了一个双向传输的先导，当向下的负先导接近地面时，一个向上的正连接先导由地面激发，正负先导的平均传播速度为 0.86×10^5 m/s，随着向下负先导的接地，将产生一个小回击过程，而由金属导线上端激发的向上正先导的传播速度为 1.1×10^5 m/s.

关键词： 空中引发雷电 先导 电场

CHARACTERISTICS OF THE LEADING PROCESSES TO THE ARTIFICAL INDUCED LIGHTNING IN THE AIR

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Abstract: We have studied the physical processes leading to one triggered lightning flash using the altitude triggering technique. The main characteristics of the triggered lightning are inferred from data of simultaneous electric field change measurements at two stations and highly time

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resolved optical signals. The results reveal the characteristics of leading propagation to the triggered lightning. When the rocket attached with a thin steel wire is ascending to the height of several hundred meters, a typical bi directional leader is initiated at the top and bottom end of the wire. When the negative leader propagating downward approaches to the ground, a positive connecting leader is excited from the ground and propagates upwards. The average speed of the negative and connecting positive leaders is around $0.86 \times 105 m/s$. A mini return stroke is produced with the connection to the ground of downward negative leader. The upward positive leader initiated from the top end of wire propagates at a speed of about $1.1 \times 105 m/s$.

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