



## 專題演講

# Radio chemical physics of the Earth's atmosphere

Speaker : **Prof. G. Golubkov**

Semenov Institute of Chemical Physics of RAS, Moscow, Russia.

Time : 107 年 10 月 26 日 星期五 14:00

Place : 健雄館(科四館) S4-811 教室

摘要/Abstract :

The main sections of radio chemical physics of the of the Earth's atmosphere are discussed. It is a science studying the resonance interactions of the electromagnetic waves with the gaseous media containing the Rydberg molecular complexes that occupy D and E layers of the upper atmosphere during solar flares. This interaction is responsible for the distortion of the signals from the satellite groups. The radiation transitions between orbitally degenerate states of these complexes form the non-coherent additional background radiation on the radio (UHV) and infrared (IR) ranges. The radiation in these wave ranges is of primary importance in a number of fundamental researches and is widely used in some technical applications. The areas of applications discussed in this lecture include the following:

- processes of distortion and delay of satellite positioning signals;
- dynamics of processes in the upper atmosphere during increases of the solar activity leading to the formation of incoherent additional background radiation; the distant passive location of the soil humidity and the salinity of the ocean waters;
- passive remote sensing of the electromagnetic properties of the Earth's surface layers for determining their structure and content;
- technology of efficient and uninterrupted operation of energy networks by synchronizing the measuring equipment in view of the possible failures of the satellite signals; the use of the global positioning systems as a tool for monitoring the state of the atmosphere;
- laser diagnostics of the atmosphere.

Further the most perspective applications of the above mentioned areas of the radio chemical physics of the atmosphere whose robustness is substantially depends on the current state of the upper atmosphere are discussed. We analyze the problems that arise here and provide their specific solutions. The prospects for the development of these applications are reviewed as well as those areas of research that are just coming up.

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