4. Methods for analyzing the obtained Signals
5. Technical guide, including DOs and DON'Ts for space charge measurement

In November 1997, the committee held a domestic technical meeting joining with other committees at Osaka, and more than 20 papers were presented from our field at the conference. The committee is going to hold a domestic technical meeting again in next November at Fukuoka, and more than 25 papers will be expected to present.

As a part of activity, the committee organized a round robin test for comparison around the measurement systems being used by committee members. From the results of the round robin test, it is confirmed that any kinds of method are available if the space charge distribution is measured with appropriate manner and the obtained signal is processed with suitable data processing technique.

The three-year activity will be published in Technical Report of IEEJ in 2000,and it will be available as a standard manual for measurement of space charge distribution.

The report will include the following subjects.

1. Principles of measurements 2. Measurement techniques 3. Typical examples for applications

Structure and Functions of Molecular Ultra-thin Films, Organic Thin Films and Interfaces

Futao Kaneko (Niigata University)
Yasuo Suzuoki (Nagoya University)
Keizo Kato (Niigata University)
Kazunari Shinbo (Niigata University)

The committee was established in July 1997,With the term of three years, The investigation has focused attention on the structure and the functions of molecular ultra-thin films, Organic thin films and interfaces related to:

1. Fabrication techniques of molecular ultra-thin films and organic thin films and evaluations of the structure,
2. New functions of molecular thin films and their interfaces,
3. Evaluations and control of optical and electrical properties at interfaces of thin films, and
4. Interface structures between different materials and evaluations of the interaction.

Up to June 1998, Six committee meetings were held. Thirteen lectures and detailed discussions among the members of the committee were carried out for their researches related to the above subjects. Furthermore, two meetings were held for lectures by distinguished non-member researchers. Observation or their research laboratories was also carried out after their lectures. The titles of the lectures were:

1. Evaluation of organic thin films using the electron microscopes,
2. Evaluation or surfaces of thin films using the electron spectroscopies,
3. Fabrications of fullerene thin films and their optical properties, and
4. Evaluation of molecular orientations in organic ultra-thin films.

There will be further lectures by the member and non-member researchers. The results of the investigation will be summarized at the end of the term.

Mechanism of Treeing Degradation and Influence of Polymer Morphology

N. Shimizu (Nagoya University)
H. Tanaka (The Furukawa Electric Co., Ltd)
M. Kanegami (Central Research Institute of Electric Power Industry)

Electrical energy is one of the most important infrastructures. XLPE cable, widely used in underground electric power transmission and distribution, plays very important role in stable electrical energy supply. Lifetime of XLPE power cable is practically decided by treeing degradation, namely electrical and water tree. The investigation of treeing phenomena is of importance concerning with reliability of electric power system.