

## MEASUREMENT OF DIELECTRIC CONSTANT OF MODEL ICE (ABSTRACT)

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In order to detect the thickness of sea ice by UHF radar, it is necessary to know the dielectric constant of the sea ice at numerous stages of ice formation. As the dielectric constant and  $\tan \delta$  of sea ice at UHF range are small, it has been difficult to measure these constants correctly using a small sample of sea ice to compare with the UHF wave length.

The authors measured the dielectric constant of model ice by the reflection method using a co-axial device in the frequency range from 200 MHz to 1 GHz. The measurement was done for ice salinity from 1.27 to 9.1 ‰, and the following results were obtained.

1) The real part of the dielectric constant of model ice increases slightly as the ice salinity increases. The measurement frequency influences the real part so the real part decreases when the frequency is raised. The ice temperature almost does not influence the real part of the dielectric constant.

2) Since the brine volume depends strongly on both salinity and temperature of the model ice, the relation between the imaginary part and the brine volume is expressed by the following:

$$\text{Log (imaginary part)} = \text{Const.} \times (\text{brine volume})^{1/2}.$$

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