

## 有機半導体レーザの利得損失と共振状態

### Gain Loss inside a resonator in organic semiconductor lasers

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Optically-driven solid-state OSCLs (op-OSCLs) have been exemplified, and laser emissions with various colors have been demonstrated to date. However, successful operation of electrically driven OSCLs (el-OSCLs) have been very difficult for long years due to the low carrier mobilities as well as the low electron-injection efficiency in OSCs. The carrier injection exceeding  $10 \text{ kA cm}^{-2}$ , which is presumably considered to be required, was indeed away from the injected current level generally to be accessible. In the approaches towards the realization of el-OSCLs, one can find some intriguing reports in the past, but almost all of them are commented not to afford to provide firm experimental evidence for operation in the electrically driven mode [1]. Recently, indication of organic semiconductor lasers has been reported by two research groups, one being in a planar type electroluminescent device [2,3] and the other being in a field-effect transistor (FET) structure [4,5]. The understanding of the condition of lasing is presently the very important and intriguing scientific issue. In this presentation, we will compare the emission properties from OSCLs in the FET structure between a Fabry Perot cavity resonator and a feedback distribution resonator both in the optical- and electrical- driven mode, and discuss the lasing condition including the gain loss inside the resonators in organic semiconductor lasers.

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