1147-13-510 **Shinichiro Iai*** (iai.shinichiro@s.hokkyodai.ac.jp). *Associated graded modules of canonical modules over almost Gorenstein local rings.*

This is a joint work with S. Goto. Let $(A, \mathfrak{m})$ be a Cohen-Macaulay local ring possessing the canonical module K_A of $d = \dim A > 0$. Assume $A/\mathfrak{m}$ is infinite. Set $\mathcal{G}(\mathfrak{m}) = \bigoplus_{i \geq 0} \mathfrak{m}^i/\mathfrak{m}^{i+1}$ and $\mathcal{G}(\mathfrak{m}, \mathrm{K}_A) = \bigoplus_{i \geq 0} \mathfrak{m}^i \mathrm{K}_A/\mathfrak{m}^{i+1}\mathrm{K}_A$. Let Q be a minimal reduction of $\mathfrak{m}$. Put $c = \mu_A(\mathrm{K}_A)$. Then two results in the talk can be stated as follows.

Proposition. *Assume that A is an almost Gorenstein local ring. Then*

$$\mu_A(\mathfrak{m}^i \mathrm{K}_A) - \mu_A(\mathfrak{m}^i) = (c-1)\binom{d+i-2}{d-2}$$

for all integers $i \geq 0$. In particular, $\mu_A(\mathfrak{m}\mathrm{K}_A) - \mu_A(\mathfrak{m}) = (c-1)(d-1)$.

Theorem. *Assume that A is an almost Gorenstein local ring. Then the following two conditions are equivalent.*

(1) $\mathcal{G}(\mathfrak{m}, \mathrm{K}_A)$ is a Cohen-Macaulay $\mathcal{G}(\mathfrak{m})$-module.

(2) $\mathcal{G}(\mathfrak{m})$ is a Cohen-Macaulay ring and $Q\mathrm{K}_A \cap \mathfrak{m}^2\mathrm{K}_A = Q\mathfrak{m}\mathrm{K}_A$.

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