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Graded multiplication modules and the graded ideal $\theta_g(M)$

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Abstract: Let G be a group and let R be a G -graded commutative ring. For a graded R -module M , the notion of the associated graded ideal $\theta_g(M)$ of R is defined. It is proved that the graded ideal $\theta_g(M)$ is important in the study of graded multiplication modules. Among various application given, the following results are proved: if M is a graded faithful multiplication module, then $\theta_g(M)$ is an idempotent graded multiplication ideal of R such that $\theta_g(\theta_g(M)) = \theta_g(M)$, and every graded representable multiplication R -module is finitely generated.

Key Words: Graded multiplication modules, Graded ideal $\theta_g(M)$, Graded secondary modules

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