Some Remarks on Modules over Generalized Dedekind Domains

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Abstract.

Let M be a finitely generated torsion-free module over a generalized Dedekind domain. In [4], the authors obtained that if M is projective, then for every minimal prime ideal $\mathfrak{p}$ of D, $\mathfrak{p}M$ is a maximal v-submodule of M and if M is not projective, then the authors found an example of M and a minimal prime ideal $\mathfrak{p}$ of D such that $P_1 \supset \mathfrak{p}M$ and P_1 is a maximal v-submodule which is not a v-multiplication submodule of M.
In this paper, for any natural number n, it is shown that there are a generalized Dedekind domain D and a Krull module M over D satisfying the properties: For each $k(1 \le k \le n)$ there is a minimal prime ideal $\mathfrak{p}$ of D and v-submodules P_i of M such that $P_k \supset P_{k-1} \supset \cdots \supset P_1 \supset \mathfrak{p}M$ and P_i are all not v-multiplication submodules for all i $(1 \le i \le k)$.