

SEPARATION IN THE BNSR-INVARIANTS OF THE PURE BRAID GROUPS

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Abstract: We inspect the BNSR-invariants $\Sigma^m(P_n)$ of the pure braid groups P_n , using Morse theory. The BNS-invariants $\Sigma^1(P_n)$ were previously computed by Koban, McCammond, and Meier. We prove that for any $3 \leq m \leq n$, the inclusion $\Sigma^{m-2}(P_n) \subseteq \Sigma^{m-3}(P_n)$ is proper, but $\Sigma^\infty(P_n) = \Sigma^{n-2}(P_n)$. We write down explicit character classes in each relevant $\Sigma^{m-3}(P_n) \setminus \Sigma^{m-2}(P_n)$. In particular we get examples of normal subgroups $N \leq P_n$ with $P_n/N \cong \mathbb{Z}$ such that N is of type F_{m-3} but not F_{m-2} , for all $3 \leq m \leq n$.

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