When are wreath products Hopfian?

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The Baumslag-Solitar group BS(2,3) is non-Hopfian.

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Proof.

 \dots something something HNN extension \dots something something Britten's Lemma.

The wreath product $A_5 \wr \mathbb{Z} = (\oplus_{\mathbb{Z}} A_5) \rtimes \mathbb{Z}$ is not residually finite.

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But $[u_0, v_m] = e$.

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Exercise

The group $A_5 \wr \mathbb{Z}$ is Hopfian.

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When are WPs Hopfian?

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Question

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 Γ non-Hopfian, Δ abelian $\Rightarrow \Delta \wr \Gamma$ non-Hopfian.

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 $\label{eq:generalized_states} \ensuremath{\Gamma} \ensuremath{ \textit{non-Hopfian}}, \ensuremath{\Delta} \ensuremath{\mbox{abelian}} \ensuremath{\Rightarrow} \ensuremath{\Delta} \wr \ensuremath{\Gamma} \ensuremath{ \textit{non-Hopfian}}.$

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 Γ soluble, Δ nonabelian simple $\Rightarrow \Delta \wr \Gamma$ Hopfian.

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