Cotorsion and Homology

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The classical concept of cotorsion of an abelian group is here characterized in the style of algebraic compactness, namely by the existence of solutions of certain systems of equations. This approach further highlights the close relation between the two concepts. Then the natural extension to nonabelian groups is related to a topological property and used to determine the first singular homology group of wild spaces. As a further application, it is shown that the abelianization of the quotient $*_i^{\sigma} G_i/(*_i G_i)$ is isomorphic to $\prod_i \mathbb{Z}/\bigoplus_i \mathbb{Z}$, for arbitrary nontrivial groups G_i of cardinality at most the continuum.