

Gaps in the number of generators of monomial Togliatti systems - Part I

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A longstanding open problem in Algebraic Geometry is the classification of smooth projective varieties verifying at least one Laplace equation. In [MMO] the authors provided a systematic way of producing examples of such varieties by relating them with homogeneous artinian ideals which fails weak Lefschetz property (WLP), such ideals are called Togliatti systems. In [MM] the authors proved that the number of generators of a minimal monomial Togliatti system of forms of degree d in $n + 1$ variables lies in the interval $\left[2n + 1, \binom{n + d - 1}{n - 1}\right]$. In this talk, we will introduce the notion of Togliatti systems, their relation with varieties verifying at least one Laplace equation, and prove that the interval $[2n + 3, 3n - 1]$ can not be realized as the number of generators of a minimal monomial Togliatti system.

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Bibliography

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