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Hilbert functions of Veronesean subvarieties and Complete Intersections

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If X is a set of reduced points lying on a rational normal curve, the Hilbert function of X is classically known. Starting from this result, we address the following problem: what are the possible Hilbert functions of a reduced subvariety of a Veronese variety? We provide a general result for any Veronese variety and then derive an effective characterisation of the Hilbert function of points lying on a Veronese surface. As an application, we completely classify the complete intersections of the ambient space that lie on a Veronese surface, and we formulate a conjecture for Veronese varieties in higher dimensions.
This is joint work with Prof. Enrico Carlini.

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