

# Non-negative forms, volumes of sublevel sets, complete monotonicity and moment matrices

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**Abstract:** I am going to present some recent results related to sublevel sets of non-negative forms, that were obtained in a joint work with Jean-Bernard Lasserre. I will show that the Lebesgue volume of the sublevel set of a positive definite degree  $d$  form is a completely monotone function and present some related properties. Furthermore, I will explain a (partial) characterization of non-negative forms, whose sublevel sets have finite volume. Finally, I will discuss an interesting property of a centered Gaussian vector, establishing a link between the matrix of its degree  $d$  moments and the  $(d/2)$ -th power of the quadratic form naturally associated to its covariance matrix.