On canonical solutions of the truncated trigonometric matrix moment problem

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The main theme of the talk is the discussion of some distinguished solutions of the truncated trigonometric matrix moment problem. Roughly speaking, we discuss certain solutions which are molecular nonnegative Hermitian matrix-valued Borel measures on the unit circle with a special structure. We give some general information on this type of solutions, but we will focus on the so-called nondegenerate case. In the latter case, the measures in question form a family of solutions which can be parametrized by the set of unitary matrices. In particular, we will see that each member of this family offers an extremal property in the solution set of the moment problem concerning the weight assigned to some point of the open unit disk. In doing so, an application of the theory of orthogonal matrix polynomials on the unit circle takes a key position to get that insight.