Mean convergence of extended Lagrange interpolation on unbounded intervals

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In [1] it was proved that if $w(x) = e^{-x^\beta} x^\gamma$, $\gamma \geq -1$, $\beta > \frac{1}{2}$, is a generalized Laguerre weight and $\bar{w}(x) = xw(x)$, then the zeros of the orthonormal polynomial $p_{m+1}(w)$ interlace with those of $p_m(\bar{w})$. Hence it is possible to consider an extended Lagrange interpolation process based on the zeros of $p_{m+1}(w)p_m(\bar{w})$. In this talk the named interpolation is considered in L^p weighted norm. Necessary and sufficient conditions on the involved weights functions are stated in order to obtain the convergence of the process and the boundedness of the Lagrange operator in subspaces of Sobolev type. Analogous results are discussed concerning the real line and the weights of Markov-Sonin type $w_\beta(x) = e^{-x^2}|x|^\beta$, $\beta > -1$.

References

[1] D. Occorsio, *Extended Lagrange interpolation in weighted uniform norm* Appl. Math. Comput. 211 (2009), no. 1, 10-22.