On the numerical radius of the compression shift

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Abstract

In 1915, Fejer gave an estimation for the first coefficient c_1 of the positive trigonometric polynomial $\sum_{j=-n+1}^{n-1} c_j e^{ijt}$ namely

$$|c_1| \leqslant \cos \frac{\pi}{n+1}$$

In 2001, C. Badea and G. Cassier prove an other inequality for all coefficients of rationnal function positive on the torus (with no principal part) according the numerical radius of a precise operator. We give an extension of this result for all rationnal function positive on the torus. We give also an estimation of the compression on the adjoint shift on the space $H^2 \ominus BH^2$ where $B(z)$ is a finite Blashke product with a unique zero. We shall speak about the property of Poncelet for the numerical radius of a precise class of operator introduced by P. Y. Wu.