GERMAN DZYUBENKO, Yu.A.Mitropolskiy International Mathematical Center of NAS of Ukraine
Nearly comonotone approximation of periodic functions

Suppose that a continuous 2π-periodic function f on the real axis changes its monotonicity at points $y_i : -\pi \le y_{2s} < y_{2s-1} < \ldots < y_1 < \pi,\ s \in \mathbb{N}$, on each period. In our resent work, for each $n \ge N$, a trigonometric polynomial P_n of order cn is found such that: P_n changes its monotonicity, like f, everywhere except small intervals

$$(y_i - \pi/n, y_i + \pi/n)$$

and

$$\|f - P_n\| \le c(s)\, \omega_3(f, \pi/n),$$

where N is a constant depending only on $\min\limits_{i=1,\ldots,2s}\{y_i - y_{i+1}\},$ c and $c(s)$ are constants depending only on $s,$ $\omega_3(f, \cdot)$ is the modulus of continuity of the 3-rd order of the function f, and $\| \cdot \|$ is the max-norm.