# Approximation of smooth functions by weighted means of $N$-point Padé approximants

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We suggest to explore the properties of two-sided estimates of Stieltjes functions $s$ by two neighboroud $N$-point Padé approximants (NPA) $p_1$ and $p_2$ to obtain a good approximation of Stieltjes-like functions, in particular: convexes functions. The idea consists in a calculation of a set of $N - 1$ rational parameters $a_i$ which optimize in each interval $[x_i, x_{i+1}]$ the approximation $a_i p_1 + (1 - a_i) p_2$ of knowing Stieltjes function $s$ and then, to use these parameters to compute the expressions $a_i f_1 + (1 - a_i) f_2$, where $f_1$ and $f_2$ are two NPA of a certain smooth function $f$. Few numerical examples show the efficiency of this experimental method to approximate the non-Stieltjes smooth functions.