

In this talk, I will introduce the Sawyer's conjecture, which was proposed by Sawyer in 1980s. Then in 2005, Cruz-Uribe, Martell and Pérez finally solved this conjecture, they also proposed a new conjecture, which can be viewed as the most singular case of several extensions of Sawyer's conjecture. I will give a positive answer to the new conjecture. Several quantitative estimates are also obtained. In the end, some open questions related to one-sided maximal functions (proposed by Martín Reyes) will be introduced. This talk is based on joint work with Sheldy Ombrosi and Carlos Pérez.