1038-42-236 **Carlos Perez*** (carlosperez@us.es), Facultad de Matematicas, Universidad de Sevilla, Sevilla, Spain, and **Sheldy Ombrosi**. *"Around a problem of E. Sawyer for the Hilbert transform and weights".*

In 1985 E. Sawyer proved a very delicate extension of the classical weak type $(1,1)$ estimate for the Hardy-Littlewood maximal function on the real line where the underlying measure is the product of $A_1$ weights and hence not doubling. The reason why Sawyer was interested on such result is because it gives a new proof of Muckenhoupt's classical $A_p$ theorem if it is assumed a priori that the $A_p$ weights are factored, namely that if $w \in A_p$ then $w = w_1 w_2^{1-p}$ for some $w_1, w_2 \in A_1$. In the same paper, Sawyer conjectured that if $T$ is instead the Hilbert transform the inequality should hold with the same hypotheses on the weights. That conjecture was proved in 2005 by D. Cruz-Uribe, J.M. Martell and the presenter author and was extended to any dimension and many other classical operators. In this talk we will present some improvement of this result and we discuss some open problems. The approach is very different from Sawyer's and it is based on extrapolation's ideas and Coifman-Fefferman estimate for small $L^p$ exponents.

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