1099-42-375 **Leonid Slavin*** (leonid.slavin@uc.edu). *Best constants for a family of Carleson sequences.*

For a non-negative function $\Phi$ on $[1,\infty)$, a dyadic $A_2$-weight $w$, and each dyadic interval $J$ let

$$c_J^{\Phi} := |J|\,\Phi\Big(\langle w\rangle_J\langle w^{-1}\rangle_J\Big)\ \left[\frac{(\Delta_J w)^2}{\langle w\rangle_J^2}+\frac{(\Delta_J w^{-1})^2}{\langle w^{-1}\rangle_J^2}\right]$$

where $\langle\cdot\rangle_J$ is the average over $J$; $\Delta_J(\cdot)=\langle\cdot\rangle_{J^-}-\langle\cdot\rangle_{J^+}$, and $J^{\pm}$ are the two halves of $J$.

Under mild monotonicity assumptions on $\Phi$ and $\Phi'$ we find the sharp functions $k_\Phi$ and $K_\Phi$ in the inequality

$$k_\Phi\big([w]_{A_2}\big)\le\sup_{I\in D}\frac{1}{|I|}\sum_{J\in D(I)}c_J^{\Phi}\le K_\Phi\big([w]_{A_2}\big).$$

The upper estimate quantifies the Carleson embedding properties of the sequence $\{c_J^{\Phi}\}$, while the two estimates combined give a range of equivalent definitions of $A_2$. The proof uses Bellman functions of various structure – some are solutions of PDE, some are nowhere differentiable – and presents optimizing sequences of weights. The results obtained make precise and significantly generalize earlier estimates by Beznosova, Wittwer, and others. (Received February 11, 2014)