Leonid Slavin* (leonid.slavin@uc.edu) and Vasily Vasyunin. The John–Nirenberg constant of BMO<sub>p</sub>.

For \( p > 0 \), BMO<sub>p</sub> is the space of all functions \( \varphi \) for which the quantity \( \| \varphi \|_{\text{BMO}^p} := \sup_{\text{interval } Q} Q \left( \frac{1}{|Q|} \int_Q |\varphi - \frac{1}{|Q|} \int_Q \varphi|^p \right)^{1/p} \) is finite. The John–Nirenberg constant of BMO<sub>p</sub>, \( \varepsilon_0(p) \), is the supremum of all \( c_0 > 0 \) for which there exists a \( C_1 > 0 \) such that for any interval \( Q \) and any \( \lambda \geq 0 \),

\[
\frac{1}{|Q|} \left\{ t \in Q : |\varphi(t) - \frac{1}{|Q|} \int_Q \varphi| \geq \lambda \right\} \leq C_1 e^{-c_0 \lambda/\| \varphi \|_{\text{BMO}^p}}.
\]

This constant has proved difficult to compute: until recently, the only known cases were \( p = 1 \) and \( p = 2 \). We deal with this difficulty by considering the dual problem of estimating (from below) the BMO<sub>p</sub> norms of logarithms of \( A_\infty \) weights. As a result, we obtain \( \varepsilon_0(p) \) for all \( p \geq 1 \) and also show that for \( 1 \leq p \leq 2 \) it is attained as \( c_0 \) above.

The proof relies on the computation of the appropriate Bellman functions, which in this setting are optimal convex solutions of the homogeneous Monge–Ampère equation on a non-convex plane domain. The geometry of these solutions is substantially different for different ranges of \( p \). Part of the work is joint with Vasily Vasyunin. (Received September 21, 2015)