1154-42-1220 **David Beltran*** (dbeltran@math.wisc.edu) and **José Madrid** (jmadrid@math.ucla.edu).
Endpoint Sobolev continuity for the fractional maximal function.

Let M_β denote the non-centered fractional maximal function on $\mathbb{R}^d$, where $0 < \beta < d$. A well known result of Kinnunen says that the $L^p - L^q$ bounds satisfied by M_β are preserved at the derivative level, that is,

$$\|\nabla M_\beta f\|_q \leq \|\nabla f\|_p, \qquad \text{for} \quad \frac{1}{q} = \frac{1}{p} - \frac{\beta}{d}$$

and $1 < p \leq \infty$. Moreover, there are some instances in which the map $f \mapsto |\nabla M_\beta f|$ satisfies strong bounds for the endpoint input space $W^{1,1}$. This is in contrast to the weak-type bounds satisfied by M_β for L^1 functions.

As the map $f \mapsto |\nabla M_\beta f|$ ceases to be sublinear, its boundedness from $W^{1,p}$ to L^q does not immediately imply that is a continuous map between such function spaces. The first affirmative result in this direction was obtained by Luiro in the non-endpoint case $1 < p \leq \infty$.

For the endpoint space $W^{1,1}$, Madrid proved the continuity of such map in dimension $d = 1$. In this talk, we will present higher dimensional results. In particular, continuity from $W^{1,1}(\mathbb{R}^d)$ to $L^{d/(d-\beta)}(\mathbb{R}^d)$ holds if $1 \leq \beta < d$ and if $0 < \beta < 1$ for radial functions. (Received September 14, 2019)