1108-44-340   **Jarod Hart*** (`jarod.hart@wayne.edu`) and **Guozhen Lu**. *Hardy Space Estimates for Bilinear Calderón-Zygmund Operators.*

In this joint work with Guozhen Lu, we find sufficient conditions for bilinear Calderón-Zygmund operators to be bounded on Hardy spaces. For a bilinear operator $T(f_1, f_2)$, we give sufficient regularity and cancellation conditions for T to be bounded from $H^{p_1} \times H^{p_2}$ into H^p for $0 < p_1, p_2, p \leq 1$. The fundamental difficulty that arises in the bilinear Hardy spaces estimates, which is not present in the linear setting, can be observed in the fact that $f_1, f_2 \in H^1$ does not imply $f_1 \cdot f_2 \in H^{1/2}$, i.e. the pointwise product operator $(f_1, f_2) \mapsto f_1(x)f_2(x)$ is not bounded from $H^1 \times H^1$ into $H^{1/2}$. The product structure of bilinear Calderón-Zygmund operators severely complicates analysis of operators on H^p when $0 < p \leq 1$, which stems from difficulties in understanding the oscillatory behavior of products of functions. Some Hardy space paraproduct boundedness properties for bilinear operators will also be discussed. In particular, we will introduce a paraproduct $\Pi(f_1, f_2)$ that maps (and is bounded) from $H^{p_1} \times H^{p_2}$ into H^p and resembles the product operator, $\Pi(f_1, f_2)(x) \approx f_1(x)f_2(x)$, in the appropriate sense. (Received January 18, 2015)