1086-11-322 **James A. Sellers*** (sellersj@psu.edu), Department of Mathematics, Penn State University, University Park, PA 16802. *Congruences Modulo Squares of Primes for Fu's k Dots Bracelet Partitions.*

In 2007, Andrews and Paule introduced the family of functions $\Delta_k(n)$ which enumerate the number of broken k–diamond partitions for a fixed positive integer k. In that paper, Andrews and Paule proved that, for all $n \geq 0$, $\Delta_1(2n+1) \equiv 0 \pmod 3$ using a standard generating function argument. Soon after, Shishuo Fu provided a combinatorial proof of this same congruence. Fu also utilized this combinatorial approach to naturally define a generalization of broken k–diamond partitions which he called *k dots bracelet partitions*. He denoted the number of k dots bracelet partitions of n by $\mathfrak{B}_k(n)$ and proved various congruence properties for these functions modulo primes and modulo powers of 2. In this note, we extend the set of congruences proven by Fu by proving the following congruences: For all $n \geq 0$,

$$\begin{aligned} \mathfrak{B}_5(10n+7) &\equiv 0 \pmod{5^2}, \\ \mathfrak{B}_7(14n+11) &\equiv 0 \pmod{7^2}, \quad \text{and} \\ \mathfrak{B}_{11}(22n+21) &\equiv 0 \pmod{11^2} \end{aligned}$$

We also conjecture an infinite family of congruences modulo powers of 7 which are satisfied by the function $\mathfrak{B}_7$. This is joint work with Silviu Radu, Research Institute for Symbolic Computation, Austria. (Received August 21, 2012)