1131-11-51 **Neranga Fernando*** (w.fernando@northeastern.edu), Department of Mathematics, 567 Lake Hall, Northeastern University, Boston, MA 02115. *Reversed Dickson polynomials of the $(k+1)$-th kind over finite fields, II.*

Let p be an odd prime and $q = p^e$, where e is a positive integer. Let $\mathbb{F}_q$ be the finite field with q elements. A polynomial $f \in \mathbb{F}_q[\mathtt{x}]$ is called a *permutation polynomial* of $\mathbb{F}_q$ if the associated mapping $x \mapsto f(x)$ from $\mathbb{F}_q$ to $\mathbb{F}_q$ is a permutation of $\mathbb{F}_q$. For $a \in \mathbb{F}_q$, the n-th reversed Dickson polynomial of the $(k+1)$-th kind $D_{n,k}(a,x)$ is defined by

$$D_{n,k}(a,x) = \sum_{i=0}^{\lfloor \frac{n}{2} \rfloor} \frac{n-ki}{n-i} \binom{n-i}{i} (-x)^i a^{n-2i},$$

and $D_{0,k}(a,x) = 2-k$. I am primarily interested in the question: When is $D_{n,k}(a,x)$ a permutation polynomial of $\mathbb{F}_q$ when n is a sum of odd prime powers? It is known that to discuss the permutaion behaviour of $D_{n,k}(a,x)$, one only has to consider $a = 1$. In this talk, I will explain the permutation behaviour of $D_{n,k}(1,x)$ when $n = p^{l_1} + 3$, $n = p^{l_1} + p^{l_2} + p^{l_3}$, and $n = p^{l_1} + p^{l_2} + p^{l_3} + p^{l_4}$, where l_1, l_2, l_3, and l_4 are non-negative integers. I will also explain a generalization to $n = p^{l_1} + p^{l_2} + \cdots + p^{l_i}$. Moreover, I will present some algebraic and arithmetic properties of the reversed Dickson polynomials of the $(k+1)$-th kind. (Received June 25, 2017)