

Cryptography based on semirings can be one of the possible approaches for the post-quantum cryptography in the public-key schemes. In our work, we are interested in only one concrete semiring – tropical algebra. We are examining one concrete scheme for the key-agreement protocol – tropical Stickel’s protocol. Although there was introduced an attack on it, we have implemented this attack and more importantly, stated its complexity. Further, we propose other variants of Stickel’s protocol and we are investigating their potential for practical usage. During the process, we came across the theory of tropical matrix powers, thus we want to make an overview of it due to the use in cryptography based on matrices over the tropical algebra semiring.