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In 1995, Alexander and Hirschowitz finished classifying all the defective secant varieties of Veronese varieties (i.e., the secant varieties of Veronese varieties that do not have the expected dimension). This work completed the Waring-type for polynomials, which had remained unsolved for some time. There are corresponding conjecturally complete list of defective cases for Segre varieties and for Grassmann varieties. Very recently, the defectivity of Segre-Veronese varieties with two factors was systematically studied and it was suggested that secant varieties of such Segre-Veronese varieties are not defective modulo a fully described list of exceptions. The secant defectivity of more general Segre-Veronese varieties is less well-understood. In this talk, we explore higher secant varieties of Segre-Veronese varieties with three or more factors. The main goal of the talk is to prove the existence of defective secant varieties of three-factor and four-factor Segre-Veronese varieties embedded in a certain multi-degree. These defective secant varieties are previously unknown and are of importance in the classification of defective cases for Segre-Veronese varieties with three or more factors. (Received August 22, 2011)