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Sung Y Song* (sysong@iastate.edu), 442 Carver, Department of Mathematics, Iowa State University, Ames, IA 50014-2104. *Character tables of the association schemes coming from the action of the groups $GU_n(q)$ on n -dimensional vectors over $GF(q^2)$* . Preliminary report.

When a finite group G acts transitively on a finite set Ω , we obtain an association scheme, so called Schurian association scheme. In this case, there is a natural one-to-one correspondence between the set Ω and the set of cosets of a point stabilizer for any element in Ω . In this talk we discuss the Schurian association schemes obtained from the action of the general unitary groups on the transitive sets of vectors over the finite fields. We will construct their character tables, and see that some of these schemes have non-Schurian fusion schemes. If time permits, we will also discuss some examples and methods to obtain a set of vectors at few angles on the unit sphere with respect to a non-singular Hermitian form. This work is based on joint work with Robert Lazar. (Received September 11, 2019)