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Alexander Woo, Benjamin Wyser* (bwyser@illinois.edu) and **Alexander Yong**.

Isomorphisms of Mars-Springer varieties for $GL_p \times GL_q$ and interval pattern avoidance. Preliminary report.

Consider the closure of an orbit of the symmetric subgroup $GL_p \times GL_q$ on the flag variety GL_{p+q}/B . We consider the question of when such an orbit closure possesses one of a certain class of properties P (examples being P =“smooth”, “normal”, “Gorenstein”, among others), in terms of the combinatorics of a symbol called a “clan” which parametrizes the orbit. The main result is that such properties can always be characterized by a combinatorial notion called interval pattern avoidance. The proof of this is essentially geometric, relying on an isomorphism between certain locally closed subvarieties of the orbit closures which we call Mars-Springer varieties. (Received January 20, 2016)