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**Linda J Patton\*** (lpatton@calpoly.edu), Mathematics Department, Cal Poly, San Luis Obispo, CA 93407, and **Mackenzie Cox, Weston Grewe, Grace Hochrein** and **Ilya Spitkovsky**. *Flat portions on the boundary of numerical ranges of 4-by-4 nilpotent matrices*. Preliminary report.

A 4-by-4 matrix has at most four flat portions on the boundary of its numerical range; three, if it is unitarily irreducible. It is easy to see that a unitarily reducible 4-by-4 nilpotent matrix has either one or no such portions, and it was conjectured by Gau and Wu in 2008 that there are at most two flat portions in the case of 4-by-4 unitarily irreducible nilpotent matrices. In our talk we will discuss the validity of this conjecture, which was proved by Miltzer, Patton, Spitkovsky and Tsai [*Operator Theory: Advances and Applications*, **259**, 2017], and will also present further details on possible configurations of these portions. Construction of matrices having the respective shapes of these numerical ranges will be given as well. (Received March 01, 2020)