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**Anthony A. Iarrobino, Jr.\*** (a.iarrobino@neu.edu), Mathematics Department 567 Lake, Northeastern University, 360 Huntington Avenue, Boston, MA 02115, **Roberta Basili** (robasili@alice.it), Via dei Ciclamini 2B, 06126 Perugia, Italy, and **Leila Khatami** (l.khatami@neu.edu), Mathematics Department, 567 Lake Hall, Northeastern University, 360 Huntington Avenue, Boston, MA 02115. *When do two nilpotent matrices commute?* Preliminary report.

We outline recent progress in understanding the irreducible family  $N_B$  of nilpotent matrices commuting with a given nilpotent matrix  $B$  of Jordan block partition  $P$ . What is the Jordan block partition  $Q(P)$  of a generic element of  $N_B$ ? This question has been related to standard bases for ideals of given Hilbert function in the local ring  $k\{x, y\}$ , and also to paths in a certain weighted poset  $W_P$  of integer points of the plane. We discuss these connections, and in particular a proof using  $W_P$  of a result of Polona Oblak giving the largest part of  $Q(P)$ . (Received September 14, 2010)