1056-Z1-609 **Neeraj Bajracharya*** (`neeraj@unt.edu`), University of North Texas, Denton, TX 76201. *Level curves of the angle function of a positive definite symmetric matrix.*

Given a real $n \times n$ matrix A, write ϕ_A for the maximum angle by which A rotates any unit vector: $\phi_A := \sup_{x \in S^{n-1}} \angle(x, Ax)$. Suppose that A and B are positive definite symmetric (PDS) $n \times n$ matrices. Then their Jordan product $\{A, B\} := AB + BA$ is also symmetric, but not necessarily positive definite. If $\phi_A + \phi_B \geq \frac{\pi}{2}$, then there exists $S \in \mathrm{SO}_n$ such that $\{A, SBS^{-1}\}$ is indefinite. Of course, if A and B commute, then $\{A, B\}$ is positive definite. Our work grows from the following question: if A and B are commuting positive definite symmetric matrices such that $\phi_A + \phi_B \geq \frac{\pi}{2}$, what is $\inf \big\{ \phi_S : S \in \mathrm{SO}_n, \{A, SBS^{-1}\} \text{ indefinite} \big\}$? In this talk we will describe the level curves of the angle function $x \mapsto \angle(x, Ax)$ of a 3×3 PDS matrix, and discuss their interaction with those of a second such matrix. (Received September 14, 2009)