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Kac's Walk on $SO(n)$ and Related Chains

Kac's walks on the sphere and on the special orthogonal group, introduced in 1953 and 1970, have long histories in the statistical physics and computational statistics literatures. I will describe the history of these walks and present a method for estimating their mixing times in terms of the singular values of a related random matrix. Time permitting, I'll introduce some closely-related but more complicated problems in random matrix theory that may be of interest to this workshop's participants.