

**Fig 3** The figure plots the 'gating charge' displaced during the energy scans of Fig 2. The figure also maps the 'electrical distance' to geometrical distance. Arrows mark the limits of S4 travel proposed from accessibility studies (reviewed by Gandhi and Isacoff, *J. Gen. Physiol.* 120:455). The curve for the 'conventional' S4 is a superposition of all scans shown in Fig 2. The displaced charge is independent of the presence of (fixed) countercharges.