MOTION BOUNDARIES IN THE HUMAN VISUAL SYSTEM ((J. B. Reppas[1], S. A. Niyogi[2] and R. B. H. Tootell[1])) [1]Harvard Medical School, Charlestown, MA. [2]MIT Department of Electrical Engineering, Cambridge, MA.

Purpose. We have studied the processing of motion boundaries in the human brain using functional magnetic resonance imaging (fMRI). **Methods.** Eight volunteers were scanned on a 1.5T G.E. magnet retrofitted for echo-planar imaging. Subjects viewed sparse random dot fields undergoing uniform clockwise/counterclockwise rotating, or expanding/contracting motions. Individual experiments contained a single type of motion boundary (e.g. occlusion, as diagrammed in A below) which was compared to a control condition of uniform motion (e.g. as diagrammed in B below). In separate experiments, the kinetic boundaries were oriented either perpendicular to the local motion vectors or parallel to it; kinetic boundaries were either static or moved consistently with one of the two surfaces that defined the boundary. A standard battery of stimuli were shown within the same experimental session to localize the retinotopic visual areas and four anatomically distinct human motion areas: V3A, MT, putative human MST dorsal and putative human VIP (Reppas et al, ARVO 1995). **Results.** No subject showed selective activation of visual areas V1, V2, V3 or MT to any type of motion boundary vs. uniform motion. In general, motion boundary stimuli selectively activated V3A, putative VIP, and occasionally MSTd; two regions not previously characterized were robustly active: (1) a posterior region near the occipital pole, possibly identical to that described by Orban et al (1995) and (2) a region in the medial bank of the inferior parietal lobe. The fMRI responses to shearing motions were larger than to occlusion. **Conclusion.** A subset of the human areas that respond selectively to wide-field motion also respond to motion boundaries. Motion boundaries activate areas other than canonical motion areas, possibly regions representing motion-defined form. *Supported by EY07980. None*