DETECTING TECHNOLOGY IN LIGHT CURVES: DARKSIDE ILLUMINATION. E. J. Korpela[1] and S. M. Sallmen[2], [1]Space Sciences Laboratory, University of California, Berkeley, CA 94720-7450, [2]Department of Physics, University of Wisconsin - La Crosse, La Crosse, WI 54601

We analyze potential effects on transit light curves induced by an extraterrestrial civilization's use of orbiting mirrors to illuminate the dark side of a tidally locked planet. Previous efforts to detect civilizations based on side effects of planetary-scale engineering have focused on structures affecting the host star output. For example, searches have been performed for IR signatures of Dyson spheres, giant structures that trap most or all of the visible emissions of a star, and radiate only waste heat (Carrigan 2009). However, many civilizations are likely to be less advanced in their engineering efforts, yet still capable of sending small spacecraft into orbit. Since M dwarfs are the most common type of star in the solar neighborhood, it seems plausible that many of the nearby habitable planets orbit M stars, despite the small habitable zone around such stars. Planets orbiting inside the habitable zone of these dim, low-mass stars will be tidally locked. Logically, civilizations evolving on such planets might be inspired to illuminate their planet's dark side by placing a fleet of small thin mirrors into planetary orbit. To provide significant illumination, these mirrors would have a collective surface area of the order of the disk area of the planet. Based on this assumption, we explore the impact on transit light curves of such a collection of orbiting mirrors.

References: Carrigan, R.A., Jr. 2009, *Bioastronomy 2007: Molecules, Microbes and Extraterrestrial Life*, 420, 415