Solar Cycle Characteristics Examined in Separate Hemispheres

JAMES GALLAGHER, Ohio Northern University — According to recent research results from solar dynamo models, the north and south hemispheres may evolve separately throughout the solar cycle. Using hemispheric sunspot area from the Royal Greenwich Observatory (RGO), we measured a phase lag between the north and south hemispheres for solar cycles 12-23, which ranged from 0-19 months. We examined the presence of a Gnevyshev gap to determine if the double-peak of any given solar cycle is caused by an averaging of two hemispheres that are out of phase. We confirmed previous findings that show the Gnevyshev gap to be a hemispheric phenomena and is not due to a superposition of sunspot indices from hemispheres slightly out of phase. We then measured the flux crossing the equator by examining Kitt Peak and SOLIS magnetograms for solar cycles 21-23 and found, on average, a surplus of northern hemispheric flux crossing during the mid-declining phase of each solar cycle.