
Hemispheric Patterns in Filament Chirality and Sigmoid Morphology over the Solar Cycle

Petrus Martens*¹

¹Montana State University (MSU) – Physics Department Montana State University, United States

Abstract

We have used two automated feature finding modules developed by the SDO Feature Finding Team (FFT), namely the "Sigmoid Sniffer" and the "Advanced Automated Solar Filament Detection and Characterization Code", to study the statistics and correlations of these two phenomena from AIA and ground-based H-alpha observations. We find some familiar, some new, and some startling results.

New, as far as we know, but expected, is the strong correlation between filament chirality and sigmoid handedness. Surprising is a double-humped distribution of the angle that filaments make with respect to the equator. Startling is that we have found no confirmation of the chirality hemispheric rule so far for the current cycle. Looking at the filament chirality data since 2000 we find earlier published results on the hemispheric chirality rule at the beginning of cycle 23 confirmed, and we also find that this rule sometimes applies while at other times there is no hemispheric rule. We will offer suggestions, but have no definitive answer as to why this happens.

Keywords: Filaments, Sigmoids, Chirality, Hemispheric Patterns, Automated Feature Finding

*Speaker