



Magneto-hydrostatic equilibrium in starspots: dependences on color (T_{eff}) and surface gravity (g)

<http://www.firstlight.cn> 2010-10-01

Temperature contrasts and magnetic field strengths of sunspot umbrae broadly follow the thermal-magnetic relationship obtained from magneto-hydrostatic equilibrium. Using a compilation of recent observations, especially in molecular bands, of temperature contrasts of starspots in cool stars, and a grid of Kurucz stellar model atmospheres constructed to cover layers of sub-surface convection zone, we examine how the above relationship scales with effective temperature T_{eff} , surface gravity g and the associated changes in opacity of stellar photospheric gas. We calculate expected field strengths in starspots and find that a given relative reduction in temperatures (or the same darkness contrasts) yield increasing field strengths against decreasing T_{eff} due to a combination of pressure and opacity variations against T_{eff} .

[存档文本](#)