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Photometric Imaging of Starspots, Techniques and Reliability

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Abstract: Historical development of the starspot hypothesis and the unsolved problems associated with it are presented. The "non{uniqueness" attributed to the spot solutions is a major problem which could still discredit current efforts of starspot modeling by photometric or spectroscopic data. The basics of the starspot photometry(direct and inverse photometric problem, and the error analysis of the inverse problem) are presented. Since an analytical formulation exists to compute synthetic light curves from the physical parameters of spots, and recomputing original parameters analytically from the synthetic curves are also possible, the starspot hypothesis is a consistent physical problem. According to the error analysis presented,that is, according to the propagated uncertainties from the synthetic curves to the recomputed parameters, most of the problems of the current modeling techniques originate from the insufficient accuracy of the observed data.