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Title: Squeezing Blood from the Stone: Maximizing the Performance of Speckle Imaging at WIYN, Gemini North, and Beyond
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Abstract: The DSSI speckle camera has been used routinely at the WIYN 3.5-m Telescope for Kepler-related observations since 2008, and more recently, at the Gemini North 8.1-m Telescope. We discuss the detection limits of the system at these two facilities, including detection rates for companions and typical results for astrometric and photometric precision. In the case of Gemini observations, astrometric precision for a typical 2-minute observation is better than 1 mas. For companions discovered early on in the program, we now have more than 4 years of astrometric data and can make a preliminary assessment about whether the companions are likely to be gravitationally bound. We also discuss techniques for improving the performance of the system beyond the current limits, and how this could impact its further use for Kepler follow-up and other exoplanet projects.