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Abstract:

Pulsar scintillation has revealed the existence of discrete scintillation screens on lines of sight of most pulsars with scintillation observations. In most cases, the astrophysical correspondence of the scintillation screen has not been identified. One great obstacle in answering ``what are the scintillation screens" is the uncertainty in their distances. Traditionally, the fractional distance of the screen to the pulsar is determined by the curvature of the parabolic arc under two strong assumptions which are now found to be invalid for most pulsars. When we break these assumptions, either VLBI observation or annual modulation of parabolic arc curvature is needed to determine the distance. We propose to do annual modulation of two carefully-selected pulsars to determine the distance to their scintillation screens along with two other scintillation screen parameters. The results will help identify the astrophysical correspondence of the scintillation screen and shed light on its physical properties.