Discoveries of Rotating Radio Transients in the Green Bank Telescope Drift-scan Survey

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Rotating Radio Transients (RRATs) are a class of pulsars characterized by sporadic bursts of emission, which make them difficult to detect in typical periodicity-based pulsar searches. Pulsar surveys have only recently become sensitive to RRATs, with the first RRATs discovered by McLaughlin et. al in 2006. The discovery of RRATs was surprising and important, as it revealed a class of neutron stars that had previously been missed by pulsar surveys, thereby suggesting a potentially enormous increase in the inferred neutron-star birthrate. Since their discovery, there has been extensive work done in order to study these fascinating objects and find their place within the global pulsar population. With only 70 RRATs presently known, this is a difficult task, hence it is imperative to make automated RRAT searches a routine part of radio pulsar searches. Using newly developed post-processing techniques for automatically identifying single bright astrophysical pulses, such as those emitted from RRATs, we have discovered approximately 30 new RRAT candidates in data from the Green Bank Telescope 350 MHz drift-scan survey (see Boyles et al. 2012, submitted; Lynch et al. 2012, submitted). Remarkably, this number of RRAT discoveries is comparable to the number of new sources discovered through periodicity searches in this survey. Considering the heavy observational biases against detecting RRATs, this alone suggests that these sources represent a significant fraction of radio-active Galactic neutron stars. A total of 7 of these RRAT candidates have already been confirmed and the remainder look extremely promising. We present the most recent results on these new RRAT candidates, describe the techniques we have developed, and discuss the implementation of these techniques on other radio pulsar surveys such as the Green Bank North Celestial Cap survey.