Enhancing Long Transient Gravitational Wave Power Spectra with Filters[1] AVI VAJPEYI, College of Wooster, ANDREW MILLER, University of Florida/ National Institute for Nuclear Physics/ Sapienza University, PIA ASTONE, National Institute for Nuclear Physics, SERGIO FRASCA , National Institute for Nuclear Physics/ Sapienza University — A challenge with gravitational wave interferometry has been detecting signals in the presence of noise and glitches. One method to make signals stand out in the presence of noise involves filtering the data suspected of containing a signal. We present an investigation of filtering a particular type of gravitational waves known as r-modes which could be important to detect isolated neutron stars. We use two dimensional fast Fourier transform filters and convolutional neural networks. We show that we can achieve an enhancement in the quality of an r-mode signal using filters that do not match the exact parameters of the signal, contrary to what is required with typical matched filtering methods.

Avi Vajpeyi
College of Wooster