

Abstract Submitted  
for the DPP20 Meeting of  
The American Physical Society

**Behavior of the Solar Near-Surface Shear Layer** KAYLEIGH JOHNSON, University of Arkansas at Pine Bluff, ERIK GILSON, Princeton Plasma Physics Laboratory, MAARIT KPYL, ATEFEH BAREKAT, Max Planck Institute for Solar System Research — My study uses the Pencil Code to focus on the characteristics and behavior of the solar Near Surface Shear Layer (NSSL). This study uses a mean-field model with forcing to try and reproduce the NSSL and focuses on comparing Cartesian with spherical coordinates. To perform these computational simulations, my study varies a set of different parameters that may be able to explain the behavior of the layer. The parameters that are examined more thoroughly in my research are the forcing strength, location, and width of the layer where the forcing is applied, and the solar rotation. To analyze the NSSL, we simplified the problem by implementing the local box approximation; this attempts to allow for the entirety of the Sun to be modelled by a single local area of the Sun. With modifications of the code, the Sun is able to be simulated in spherical coordinates. This allows for the behavior of the Sun as a whole to be modelled more realistically.

Kayleigh Johnson  
University of Arkansas at Pine Bluff

Date submitted: 10 Jul 2020

Electronic form version 1.4