

springs, can allow for the propagation of dispersive shock waves (DSWs). The waves produced by an initial disturbance in the chain have an amplitude-dependent velocity (i.e. the higher amplitude parts of the wave travel at a different speed than the lower amplitude parts), thereby allowing for the eventual creation of a shock wave that travels through the chain. My work this summer began with understanding the differential equation for the strain on the masses in the chain and my coworkers worked on writing code to numerically approximate the solution to this equation and reproduce some graphs of this approximation (Figure 1)

The next stage of my work focused on the Korteweg-de Vries (KdV) equation, which can be derived from the original differential equation if some approximation is allowed. I then followed a derivation of an explicit solution to the KdV equation, meaning that I then had a solution into which I could plug values for the mass number and the time to get the

original equation. Producing a graph comparing the two was difficult (the best attempt is Figure 2) given that there are a large number of constants