Jan 7.

Check Validity of Equation of Motion with Andrew

After being very confused about why my SU(3) result doesn't look right, I checked with Andrew today to make sure my equation is correct. We input a few numbers into our potential term of the equation of motion and check result match. Also, we took a special case of SU(2), whose simplified analytic form is given in our paper, and compare. For a good hour, mine was correct, but Andrew's numbers were off. He was so worried! But later, it turned out he was just not calling his simple roots vector correctly. After using his own code properly, we decided that both of our equation of motions are completely correct. I want to stress, to my future self reading this, that I shall not doubt my equation's correctness again.

I did learn something new: the equation of motion I am currently using is not optimal at all. I am currently computing a sum for every point. This can be simplified using a delta function relation between the simple roots. I will eventually optimize the code and fix this.

BPS Initial Grid

After making sure the equation of motion I used is correct, I decided that it must the fault must lie on the initial grid. It turns out that I have been using the boundary value as a constant initial configuration, while Andrew did something much smarter. He guessed the vacua that ought to be inside, solve the corresponding BPS equation, and make the initial grid to be (repeated) BPS solutions. This will guide the computer to the right solution.

I hope that my SU(3) solution will work after adapting to the BPS initial grid. I spent the entire evening writing this code. I started a "BPS Initial Grid" new branch, copied the old "Domain Wall" repository code for solving BPS, and started modifying it into a small package that be called upon in the confining string repository.

New-School-Year List

Just like the Christmas list, I will create a new to-do list, named after beginning of the new school year. The goal is to finish this by end of January.

1. Finish BPS initial grid.
2. Successfully solve SU(3) confining string.
3. Do a edge effect study of SU(3), hopefully confirming the SU(2) result that there is basically no edge effect.
4. Optimize the code by using a shortcut equation of motion.

5. Optimize the code by running it on half grid.