Notes on the progressing version of the DNLS Reading:

The primary file is DNLS\_Reader\_v1.m:

The default options for the ODE45 for the odeset are ('RelTol',1e-3,'AbsTo',1e-6). Increasing the accuracy does not appear to affect the results, it only increases the time it takes to evaluate. The number of the left (1e-3) can be lowered to 1e-2, as it appears to only slightly affect the resultant eigenvalues, while significantly lower the elapsed time. However if the second parameter is lowered to 1e-5, it appears that eigenvalues start to appear that would not be found with the default values of the parameter, so the recommended setting at the moment is ('RelTol',1e-2,'AbsTo',1e-6).

6/1/2016

Extended ability of code to evaluate scattering data for rotationally asymmetric case. The B-field direction to the left, theta\_M, and to the far right, theta\_P, are set for right now in the ‘user defined parameter’ section of Reader\_v3\_B. It is expected that theta\_M = 0 normally simply for convenience while theta\_P must match the direction of the B-field at the right-most quiescent edge of the B-field profile that is to be evaluated within the IST.

5/26/2016

From comments in DNLS\_Reader\_v2\_B.m:

%5/26/2016

%--> changed call to graphing to allow them to be brought up separately

%in non-overlapping regions of RHS of display. Any open figures are

%automatically closed at start of function.

%--> Continuous spectra evaluated and graphed

% --> Modified search for real eigenvalues to use the 'Bisection

% Method' which allows for arbitrary precision given pairs {la, lab}

% bracketing each sign change. Previously we had used the midpoint

% between sign changes to report eigenvalues. The Bisection method is a

% systematic and efficient extension of this naive approach.

%--> 'cleaned up' some previous functionality into function calls

%--> changed format of Complex Eigenvalue plot

%--> fixed bug in ComplexEVFinder that arose if there were 0 or 1 complex

% -->developed method to evaluate radiative scattering data and to

% graph it

% --> moved all functions to section at top of code

Development goals from code comments:

% 1) Integrate all user declared variables to be set from 'Call\_DNLS\_Reader'

% 2) Implement Zach's EV evaluation loop with method to write results

% to file for archiving

% 3) Develop labeling features for graphs: Titles, axes, parameters,

% updates, location of complex eigenvalues

% to 'energy' and net B-field rotation.

% 4) Develop method for evaluating bright/dark character of real

% eigenvalues as well as their corresponding soliton positions ... and

% recording these to an archive file

%5) Streamline archiving of results found with ‘DNLS\_Reader’ including:

Graphics, real eigenvalues, complex eigenvalues, numerical values for continuous spectrum as well as parameters used in the evaluation of these results.

Call\_DNLS\_Reader\_v2\_B.m

Added argument ‘boolBgraph’ passed in call to DNLS\_Reader\_v2\_b. A minor step towards goal #1 above.

🡪 a small step towards goal of having all user specified parameters invoked in ‘Call\_DNLS\_Reader’ and subsequently passed to ‘DNLS\_Reader’.