Notes on PDE Codes

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Purpose:
The purpose of this document is to identify the applicability of various codes for solving PDEs presented in this course. The table of codes is provided

Table:

code	PDE TYPE	Linearity	# of PDEs	dimension	BCs
linparapde_euler.m	para	lin	1	1t/1s	D
linparapde_crank.m	para	lin	1	1t/1s	D
linparapde_crank_anyBC.m	para	lin	1	1t/1s	DNM
parapde_1_anyBC.m	para	nonlin	1	1t/1s	DNM
parapde_1_anyBC_flow.m	para (w/ flow)	nonlin	1	1t/1s	DNM
parapde_n_anyBC.m	para	nonlin	N	1t/1s	DNM
parapde_n_anyBC_flow.m	para (w/flow)	nonlin	N	1t/1s	DNM
hyperpde_n_anyBC.m	hyper	nonlin	N	1t/1s	DNM
ell_liebmann.m	elliptic (Laplace)	lin	1	0t/2s	D
parapde_n_anyBC_2d.m	para (xy)	nonlin	N	1t/2s	DNM
parapde_n_anyBC_2d_cyl.m	para (rz)	nonlin	N	1t/2s	DNM

Legend:

Type of PDE:
- para = parabolic
- hyper = hyperbolic
- ellip = elliptic
- (w/ flow) = with large convection term

Linearity of PDE:
- lin = linear
- nonlin = nonlinear

Number of PDEs:
- 1 = one equation
- N = system of equations

Dimensionality of PDE:
- 1t/1s = one temporal dimension & 1 spatial dimension
- 1t/2s = one temporal dimension & 2 spatial dimensions
- 1t/3s = one temporal dimension & 3 spatial dimensions
- 0t/2s = no temporal dimension & 2 spatial dimensions
- 0t/3s = no temporal dimension & 3 spatial dimensions

Type of Boundary Conditions:
- D = Dirichlet BCs only
- DN = Dirichlet or Neumann BCs
- DNM = Dirichlet, Neumann or Mixed BCs

Coordinate System:
- xy = Cartesian (2-D)
- rz = cylindrical (2-D)