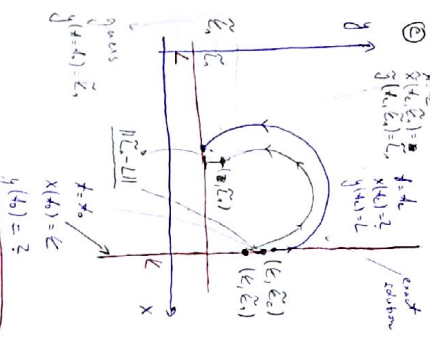


General description

- 1) ODEs / linear script
- 2) SODE + BC & IC solved
- 3) S/A/E soln (iteration)
- 4) SODE + IC soln (E < L)



Goal: find  $\|L_e - L\| = 0$

$L \rightarrow \infty$

- 1)  $\|L_e - L\| = 0$  ...? what  $t$  is?
- 2)  $\|L_e - L\| = 0 \Rightarrow$  SYSTEM of NON-LINEAR ALGEBRAIC EQUATIONS  $\Rightarrow$  NEWTON

SODE-IC soln (E < L / EUEE)

- 1) choose  $x_0$  or  $x_L$
- 2)  $x_0 = x(t_0) = L$ , choose  $y(t_0) = E$   $\Rightarrow$  IVP (initial value problem) (1)
- 3) integrate (1) with IC (2) &  $\overline{L}$
- 4) calculate  $\|y(t) - L\|$  & compare with request 2-4: want  $\|y(t) - L\| = 0$
- 5) Gauss

One case:

$y_0, y_e \dots$  will be expanded

$y_0: \mathbb{R}^n \rightarrow \mathbb{R}^n$ ;  $y_e: \mathbb{R}^n \rightarrow \mathbb{R}^n$

$x_0: \mathbb{R}^1 \rightarrow \mathbb{R}^1$ ;  $x_e: \mathbb{R}^1 \rightarrow \mathbb{R}^1$

$x = x_0$ ;  $x = x_e$

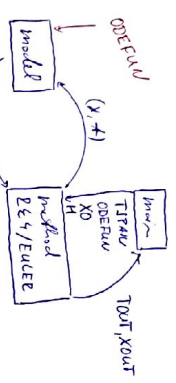
BVP solver

partial method  $\Rightarrow$  NEWTON

initial method  $\Rightarrow$  E < L / EUEE

Note: Repetition from the last time

(SODE + IC solution soln) (1)



ODEEVAL

MODEL (y, t)

INITIAL x0, H

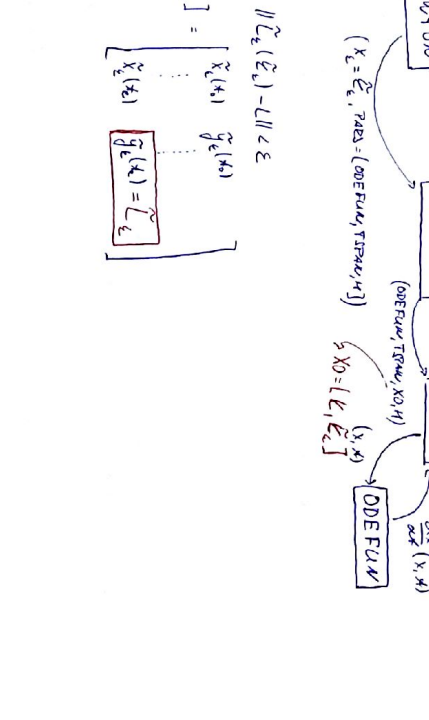
TFINAL/EUEE x, H

dx/dt(x, t)

NOTE: add the time at which the sol. is needed

JOUR ... solution

ODEFUN ... function handle ('constant') of the model function



Program: what

main: what needs to be specified?

- (i) for Newton:  $L, E$  all the way to the given example
- (ii) for SODE soln: TFINAL, ODEFUN
- (iii) when do I get the  $x_0$  for SODE soln?

What do I want? for ... plot of an approximation to the solution of the BVP

$x$  and  $\overline{L}_e$ , that  $\|L_e(\overline{L}_e) - L\| < \epsilon$

$x = x_0$   $x_{\text{OUT}} = [x_e, y_e]$

$x_e$   $y_e(x_e) = L_e$