● 1/Data Structure /2/Code Structure

1) old fashioned; Dataset: single particles

X(3, NMAX)

configure.log

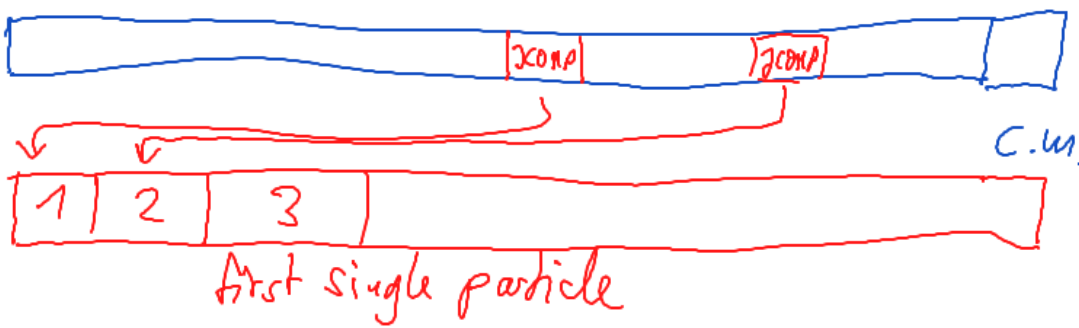
Particle 1 Particle 2 . . . . Particle N

x_1 x_2 x_3

N is numb of particles actually used, input par.

$N \leq NMAX$ - $N \ll NMAX$

KS binary is doing: 1COMP, 2COMP



NEW KSREG:

c.m. particle, N+1

first single particle

binary first single

KSTERM:

1 2
single particles

If 10.000 KS Linaries:

IFIRST = 20001

NTOT = N + NPAIRS
total elements used;

IFIRST = 2×NPAIRS + 1
index of first single part.

Find two kinds of do loops:

DO . 1, N
all particles

DO .. IFIRST, NTOT
particles in Hermite scheme

How do we find a particle? Variable NAME(I) is defined for all outputs:

NAME(1) particle initially at pos. 1 ($t=0$) (most massive particle)

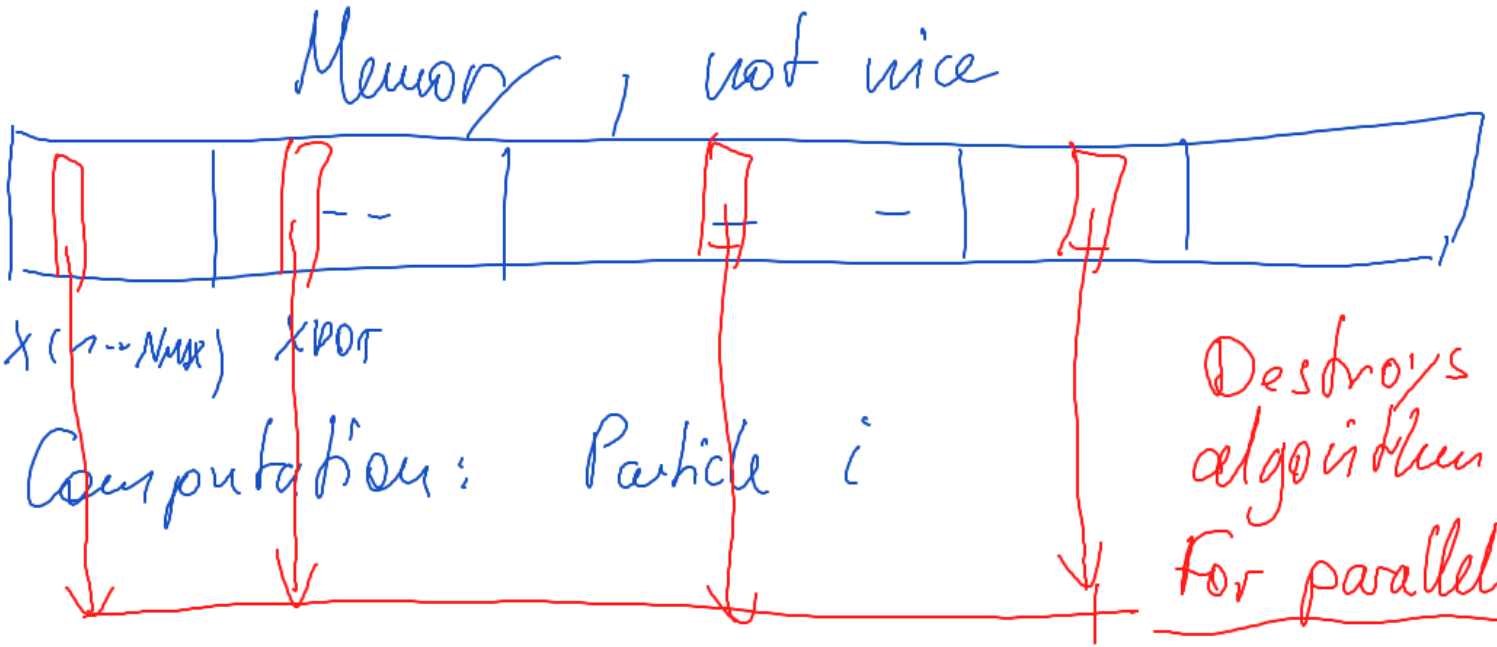
~~IF (I.EQ.1) ...~~

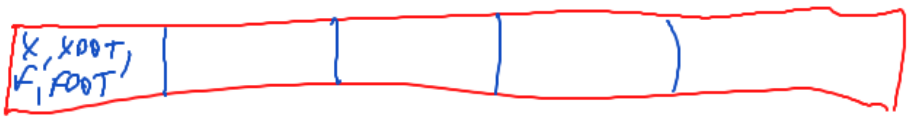
IF (NAME(I).EQ.1) ...

Fortran Style COMMON BLOCKS, include/commonb.h

X, XDOT, XØ, XØDOT, F1, FR, F1DOT, F1DOT

x_p v_p last x_c last v_c a_{ir} a_{reg} $\dot{a}_{ir}$, $\dot{a}_{ir}$



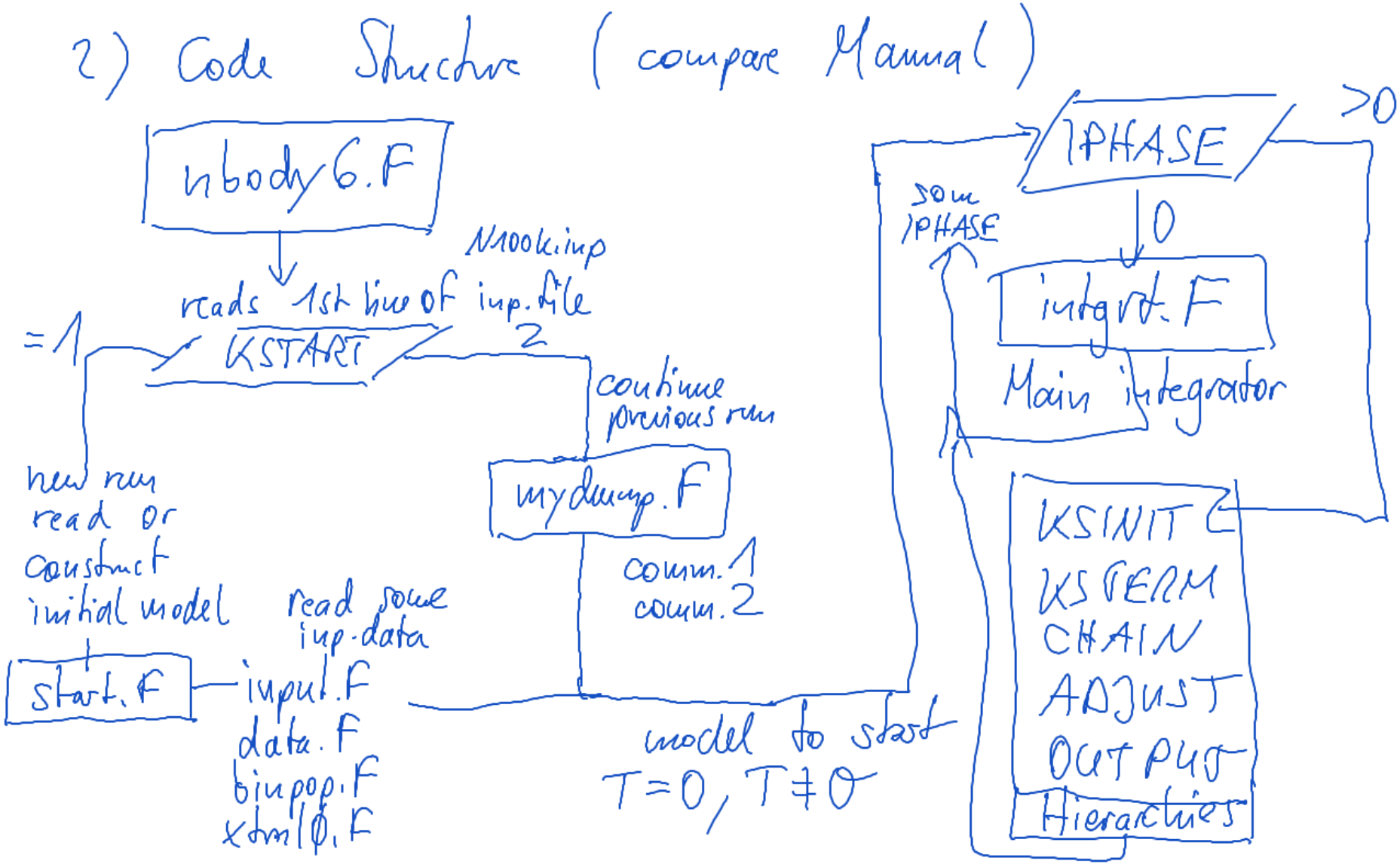


XMPI
VMPI

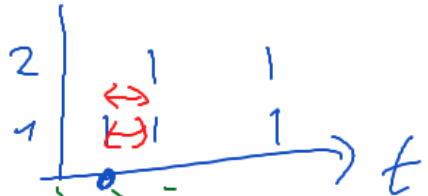
integrd. F

New Data Structure is currently only used for parallel processing

2) Code Structure (compare Manual)

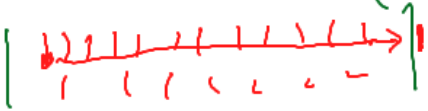


intgrt



TBLOCK current time

What I have to do at this time?



TBLOCK

> TBLOCK = TIME

1) Advance KS pairs, chains

2) Check for new KS pairs

MP1 3) Do correction Step for irregular particles due — Open MP Case

Are there any regular steps due?

MP1 4) Do correction step for regular particles due GPU

5) Advance all stellar evolution / mass loss

↓ Final Step: Check for Kstem, Adjust (energy check) → jump out with IPHASE

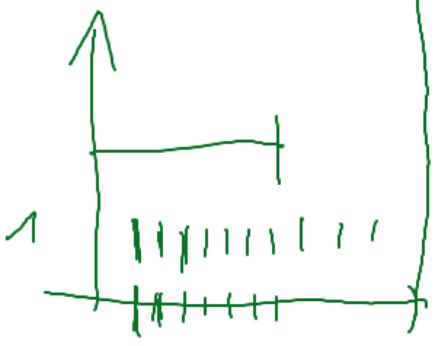
TBLOCK = TBLOCK + Δt

(sorted list of particles in time, to find next particles for corr. Step.)

Things to do:

1) Binary parallelization, KS integration (idea by Daiichi + Sp, Wang)

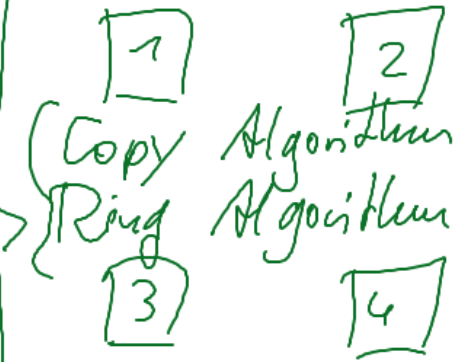
block step, in :2



integrate binaries in parallel on smaller block level

Dorband, Hemsendorf, Merritt 2003
Makino 2002 (GRAPE)

2) Domain Decomposition Nodes



Full Copy of all data; parallelization of working loops

many particles with small steps