

# CHAIN routines

Routine	Called by	Description
CFUNCS	INVERT	C-functions for two-body iteration.
CHAIN	MAIN & INTGRT	Main routine for chain regularization.
CHSTAB	CHAIN	Chain stability test (Mardling criterion; $N = 3$ ).
CONST	CHAIN & CHINIT	Constants of motion.
CSTAB2	CHAIN	Degenerate triple chain stability test (M 2008).
CSTAB3	CSTAB4	Perturbed triple chain stability test (MA 1999).
CSTAB4	CHAIN	Four-body chain stability test.
CSTAB5	CHAIN	Five-body chain stability test.
DERQP	DIFSY1	Derivatives of chain variables.
DIFSY1	CHAIN	Bulirsch-Stoer integrator.
EREL	CHAIN & DERQP	Dominant two-body energy in chain (also QPMOD).
HPSORT	SELECT & CHMOD	Heapsort algorithm of Press.
INCLIN	CHSTAB & RECOIL	Inclination of hierarchical system (also IMPACT).
INVERT	CHAIN	Inversion of physical time interval.
KSPHYS	SWITCH & TRANSX	Transformation from KS to physical variables.
PHYSKS	SWITCH & TRANSQ	Transformation from physical to KS variables.
QFORCE	DERQP	Transpose of $Q \cdot 2F$ .
QPMOD	CHAIN	Modification of chain variables for tidal dissipation.
R2SORT	CHAIN & CHTERM	Sorting of square two-body separations.
RECOIL	CHAIN	Binary analysis and final output.
REDRAW	SELECT	Checking of chain connections.
SELECT	CHAIN & SWITCH	Determination of chain indices.
SLOW	CHAIN	Slow-down treatment of binary ( $\#26 > 1$ ).
STABLC	QPMOD	Chain stability test (synchronous orbit & large ratios).
SWCOND	CHAIN	Switching condition check.
SWITCH	CHAIN	Switching of chain.
TRANSK	EREL & QPMOD	Transformation to physical momenta & separations.
TRANSQ	CHAIN	Transformation from chain variables to KS.
TRANSX	CHAIN	Transformation from KS to chain variables.
VECTOR	DERQP	Matrix multiplication of $Q^T \cdot P$ .
XTF	DERQP	External chain force.
XTRNLU	CHAIN	Harmonic test potential (suppressed).
YCOPY	CHAIN & SWITCH	Copy Y-array from COMMON.
YSAVE	CHAIN & SWITCH	Save Y-array in COMMON.

# NBODY interface routines

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ABSORB	CHMOD	Absorption of chain member(s).
CHAOS2	QPMOD	Chaotic treatment of tidal capture (#27).
CHDATA	OUTPUT	Basic data for chain members.
CHFIND	KSREG	Identification of global c.m. chain index after new KS.
CHFIRR	CHINIT & REINIT	Force & derivative on chain c.m. (NBINT & REGINT).
CHINIT	CHAIN	Initialization of chain regularization.
CHLIST	CHINIT & CHFIRR	Perturber list for chain (also CHFIND & REINIT).
CHMOD	CHAIN	Modification of chain membership.
CHPERT	CHLIST	Chain perturber selection.
CHPOT	ENERGY	Potential energy correction due to chain.
CHTERM	CHAIN	Termination of chain and N-body initialization.
EXPEL2	CMBODY	Common envelope stage for chain (#19).
FCHAIN	NBINT & FFD	Irregular force due to chain (KCPERT & KSPERT).
GHOST	ABSORB	Creation of ghost particle.
GIANT2	CHAOS2	Structure constants for giants (#19, #27).
KCPERT	CMFIRR & CMFREG	Perturbation on KS pair due to chain.
REDUCE	CHMOD & STABLC	Reduction of chain (single body or binary).
REINIT	ABSORB & REDUCE	Re-initialization of chain system.
RENEW	CHTERM	Re-activation of dormant KS binary (#26 < 2).
SETSYS	CHINIT & ABSORB	Selection of chain components.
TCHAIN	CHINIT & REINIT	Time interval for next chain perturber or c.m.
XCPRED	CHFIRR & FCHAIN	Prediction of chain coordinates & velocities (XTPERT).
XTPERT	XTF	External accelerations due to N-body perturbers.

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