

0.22

JADE COMPUTER NOTE 86
TAGGING SYSTEM MONTE CARLO
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ABSTRACT

This note describes a new package of routines for simulating the JADE tagging system as part of the MCJADE program.

Introduction.

The current JADE Monte Carlo program (MCJADE) uses a program called FWDDET to do tagging system tracking. This routine is old and obsolete as it only simulates the 1979/80 (Mark I) tagger. The new package of routines simulates all the different flavours of tagging system (see Table 1) that have existed to date.

Using the program.

Assuming for the moment that one has a new version of MCJADE with the new routines installed, the user must take care of certain control parameters, in order to insure that the program works as required.

The simulation currently recognises 4 different 'flavours' of tagging system, as described in the table below:

DATE	'MARKMC'	MARK (as used by TAGAN)	COMMENTS
YEAR < 1981	1	0	mark I apparatus
1981 & MONTH < 7	2	1	mark II apparatus : no lead snouts
1981 & MONTH > 6	3	1	lead snouts
1982	3	1	" "
YEAR > 1982	4	2	mark III apparatus

Table 1

The program decides which value of 'MARKMC' to use on the basis of a date which it reads from the common 'TODAY'. This is the same scheme as is used in the muon routines. The format of the common is:-

INTEGER*2 HDATE
COMMON/TODAY/HDATE(6)

where :

HDATE(1) = second
HDATE(2) = minute
HDATE(3) = hour
HDATE(4) = day
HDATE(5) = month
HDATE(6) = year

Providing the values are correctly set for the simulation you require, before MCJADE is called, then all will be well. For every event, the initialisation routine MCTAGI is called and sets the value of MARKMC using the values in HDATE, and for the first event prints out a small message, to tell you what has happened. If an illegal date is found it will print a warning and use the default date of 1/7/1982 (MARKMC = 3).

When data is written out, the routine STATAG sets the value of the lower 16 bits of the ATAG bank descriptor to have the value MARK. This ensures that TAGAN knows which simulation has been done and can act accordingly. (This scheme is thus identical to that used to mark the real data ATAG banks, except that the upper 16 bits are used in that case.) Unfortunately, for events where there is no ATAG bank, the graphics routines do not know what hardware to draw for the tagging system. To overcome this, STATAG also copies the value of words 4-6 of HDATE, into words 93-95 of the HEAD bank. TAGAN also prints out a message, which should agree with the one from the simulation program. For more details of this see J.C.N 74. Note that the user should also ensure that the smearing date for the TP step is set to agree with the tagging system date. For details of this see J.C.N 66.

N.B. Data that has been generated using the old FWDDDET/STATAG routines will be (correctly) treated as 1979/80 M.C. data.

Installing the programs.

The following changes are necessary in order to use the new package:

In M C J A D E

Replace call to FWDDDET with call to MCTAGM and remove reference to IFWHIT as in following code fragment:

```

1011      CALL EVTINI
          IJETCP = 0
C          IFWHIT = 0          this variable no longer used
C
          ...
C          FWD TRACKING
C          CALL FWDDDET( PV, R0, IFWHIT )
C
C          CALL MCTAGM( PV, R0 )
C
C          BRANCH ACCORDING
C          TO CHARGE OF PARTICLE

```

In E V T I N I

Insert call to MCTAGI as in following code fragment.

```

C          COMMON / CGGRAW / HGG(192)          this common no
C                                                  longer used
C          EQUIVALENCE (HGG(1),IGG(1))

```

*This change is
not done on MCTAG.S.*

C
C
C
C
C 30
C
C
C

INITIALIZE FWD LG BLOCKS

DO 30 I=1,96
IGG(I) = 0

CALL MCTAGI

STATAG

Replace with new version, calling sequence from WRTMCB is unchanged.

NEW ROUTINES

The following new routines must be picked up by the link editor:

✓ MCTAGF
✓ MCTAGM
✓ MCTAGI
✓ MCTAGC
✓ MCTAGB
✓ MCTAGS
✓ MCTAGR
✓ MCTAGE
TAGS2H*

format error
MCTAGZ

*MCTAG PY entry
EØ*

*MCTAGE → EØ
?*

These currently reside on:

NINT

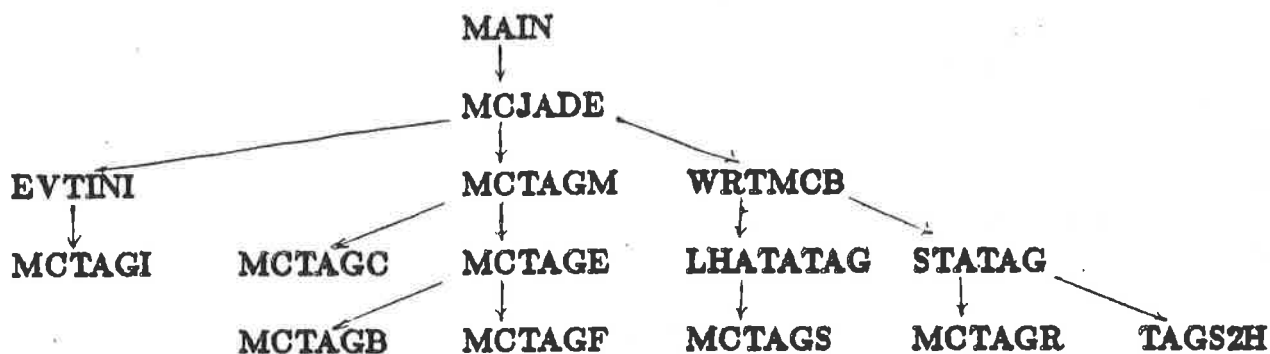
SOURCE:
LOAD:

'F22FIN.MCTAG.S'
'F22FIN.MCTAG.L'

* Except for TAGS2H which is one of the routines used by TAGAN, and is kept on:
F11LHO.TAGG.S/L .

On 7/11/85 the routines will be copied on to F22ELS.JMC.S/L , and installed as standard according to the above scheme.

Appendix 1 : Structure chart.



NOTE: LHATAG is an entry point in STATAG

Appendix 2 : Commons.

The following commons are used:-

COMMON

TODAY

CWORK

CMCTAG

USED BY:

MAIN(?)
MCTAGI

STATAG

STATAG
TAGS2H

MCTAGI
MCTAGM
MCTAGR
MCTAGS
STATAG
LHATAG

Appendix 3 : Method of simulation.

For electromagnetic showering particles, that strike the face of the tagger within certain minimum and maximum theta angles, the distance to the shower maximum in z is calculated. The transverse spread of the shower is then simulated using a simple Monte Carlo integration of functions whose parameters have been adjusted to fit the data. All energies are smeared. For all events in which at least one shower has been produced, the fluctuating pedestals that are seen in the data are also reproduced.