ADAS Subroutine rqvnew

```
       FUNCTION RQVNEW(Z,N11,N,PHI,ZP, AMSIMP,TP,VDISP)
C
       IMPLICIT REAL*8(A-H,O-Z)
C
C-----------------------------------------------------------------------
C
C  ****************** FORTRAN77 FUNCTION: RQVNEW ***********************
C
C-----------------------------------------------------------------------
C  PURPOSE: EVALUATES ION IMPACT RATE COEFFICIENTS OF
C           VAINSHTEIN ET AL 1981
C
C  (ALTERNATIVE TO RQVAIN WITH BETTER MAXWELL AVERAGING BUT SLOWER)
C
C  ROUTINE MUST RETURN EXCITATION RATE COEFFICIENT IF N11.LT.N   AND
C  DEXCITATION RATE COEFFICIENT IF N11.GT.N
C
C  NOTE THAT THE RELATION BETWEEN INVERSE PROCESSES IS DETERMINED BY THE
C  TEMPERATURE TP AND THE SPEED VDISP
C  THE TREATMENT GIVEN IS APPROXIMATE EXCEPT IN THE LIMITS VDISP=0 OR
C  VDISP >> DSQRT(2*TP/AMSIMP)
C
C  INPUT
C      Z      = TARGET ION CHARGE+1
C      N11    = PRINCIPAL QUANTUM  NUMBER OF INITIAL LEVEL
C      N      = PRINCIPAL QUANTUM  NUMBER OF FINAL   LEVEL
C      PHI    = (IH/EIJ)F(N ---> N'')
C      ZP     = PROJECTILE CHARGE
C      AMSIMP = PROJECTILE MASS (PROTON UNITS)
C      TP     = PROJECTILE ION TEMPERATURE (K)
C      VDISP  = CONSTANT MEAN SPEED SHIFT FOR THE COLLISION (CM/SEC)
C                     (DESCRIBES BEAM PLASMA SITUATIONS)
C
C  OUTPUT
C      RQVNEW = RATE COEFFICIENT (CM**3 SEC-1)
C
C
C  ********* H.P. SUMMERS, JET                2 JUL 1991   ************
C
C NOTES: THIS ROUTINE IS NOT YET PROPERLY ANNOTATED
C
C UNIX-IDL PORT:
C
C VERSION: 1.1                          DATE: 16-1-96
C MODIFIED: TIM HAMMOND (TESSELLA SUPPORT SERVICES PLC)
C               - FIRST VERSION
C
C VERSION: 1.2                          DATE: 08-02-96
C MODIFIED: TIM HAMMOND (TESSELLA SUPPORT SERVICES PLC)
C               - REMOVED SUPERFLUOUS VARIABLES
C
C VERSION: 1.3                          DATE: 16-05-07
```

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C MODIFIED: Allan Whiteford
C             - Updated comments as part of subroutine documentation
C               procedure.
C-----------------------------------------------------------------------
C
C-----------------------------------------------------------------------
C
      INTEGER             N,           N11
      REAL*8              AMSIMP,      PHI,         TP,          VDISP
      REAL*8              Z,           ZP
```