NOTES ON THE PROPOSED FORMAT FOR EXPORTING NUCLEIDE DATA TO PENELOPE

1. **The document `EXPORT_FORMAT` describes the format of PenNuc files, intended to be used for PENELOPE Monte Carlo simulations. Each nuclide is described by a sequence of ordered records, each starting with an alphanumeric TAG (3 characters) that describes the record contents.**

2. **Excepting the following TAGS: TYPE of disintegration and MODE of transition, alphanumeric TAGs are intended to facilitate the lecture of data files, but are not needed for computing purposes, given that the reading of data is based on a predefined sequence, as indicated in the format.**

3. **Data are separated by ' ; ' and '.' is used for decimal point (as it is in ENSDF).**

4. **Probability normalization is carried out at the level of daughters and then for branches and transitions. To this regard, the numerical way used to give these data is not relevant (they could be in percent or normalized to 1 or to the total emission for this level).**

Remark :
Atomic fundamental data as well as resulting X-ray and Auger electron emissions are not listed here, these is not useful for Penelope which makes its own calculations, but it could be useful for other purposes or calculations.

CODE	VARIABLE NAME	MEANING			
PAR		Name of parent nuclide			
AZP	A, Z	A and Z of parent nuclide			
NDA	NDAUGH	Number of daughters			
	LOOP in NDAUGH (Daughters)				
DAU		Name of Daughter nuclide			
DDE	PDAUGH, UPDAUG, NLEVEL, NBRANCH	Probability of disintegration to NDAUGH, uncertainty, number of **excited** levels in NDAUGH, Number of Branches to NDAUGH (DDE = daughter description)			
Q	Q, UQ	Total energy of the branch			
TYPE	**LOOP in NBRANCH (Number of branches for each daughter)**				
ALP BEM BEP CK CL1 CL2 CL3 CM CN	TYPE, BR, UBR, IFLEVEL, EBRANCH, UEBRANCH, PROHIB	Type of disintegration (see CODE), Branching ratio, uncertainty, level fed in daughter, Energy, uncertainty, Prohibition factor for beta emissions (meaningless for alpha decay)			
MS	, , LEVELN	Level number (Metastable gamma)			
		Next branch			
	END OF LOOP in NBRANCH				

	LOOP in NLEVEL (number of levels for each daughter, Starting in NLEVEL, ending in 1)				
LED	ELEVEL, UELEVEL, NTRANS, DTIME, UDTIME, LEVELN	Energy of the level, uncertainty, number of transitions that depopulate this level, level time (LED = Level Description), uncertainty, Level number			
MODE	**LOOP in NTRANS (number of transitions depopulating this level)**				
GA EK EL1 EL2 EL3 EM EN	MODE, PTRANS, UPTRAN, ETRANS, UETRAN, IFLEVELT	Type of transition (see CODE), Probability of the transition, uncertainty, Energy of the emitted radiation, uncertainty, Level fed			
	Next transition				
	END OF LOOP in NTRANS				
	Next level				
	END OF LOOP in NLEVEL				
	Next daughter				
	END OF LOOP in NDAUGH				

CODES		CODE	
TYPE OF DISINTEGRATION (KTYPE)	ALPHA BETA- BETA+ Electron Capture K Electron Capture L1 Electron Capture L2 Electron Capture L3 Electron Capture M Electron Capture N… METASTABLE GAMMA	ALP BEM BEP CK CL1 CL2 CL3 CM CN MS	
TYPE OF TRANSITION (MODE)	GAMMA Conversion Electron K Conversion Electron L1 Conversion Electron L2 Conversion Electron L3 Conversion Electron M Conversion Electron N	GA EK EL1 EL2 EL3 EM EN	γ emitted intensity ec_K emitted intensity ec_{L1} emitted intensity ….
PROHIBITION FACTOR	Allowed and first forbidden First unique forbidden Second forbidden Second unique forbidden Third forbidden Third unique forbidden Fourth forbidden	0 -1 1 -2 2 -3 3	