Input data of PEGS5

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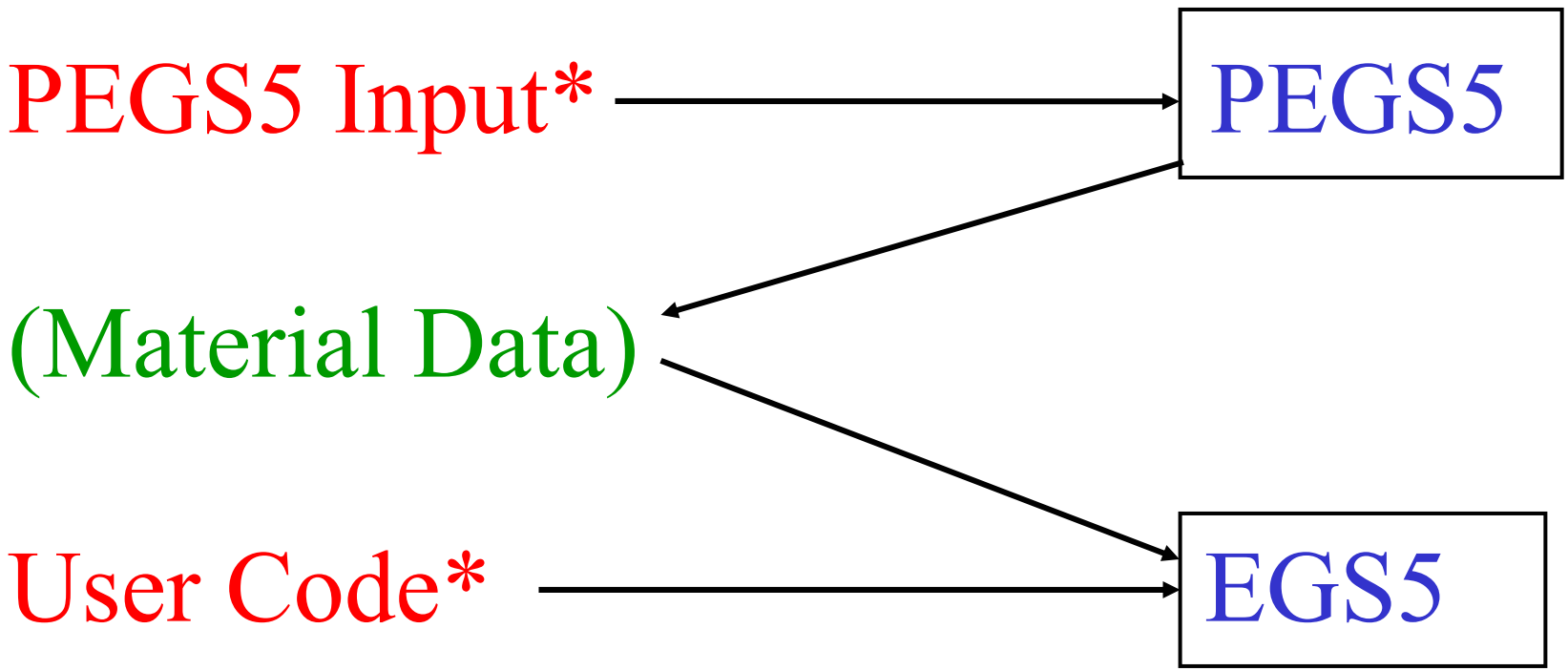
PEGS5 and EGS5



* Specify names in egs5run

Examples of Input File for PEGS5

	Element	Compound	Mixture
Solid, Liquid	Iron	Acryl	Lead glass
Gas	Xe gas	CO_2, H_2	Air

Iron: Elements, Solid

```
ELEM
  &INP IAPRIM=1, IRAYL=1,EFRACH=0.05,EFRACL=0.2,
IBOUND=0,INCOH=0,ICPRF=0,IMPACT=0 /

FE-RAYLEIGH                          FE

FE
```

- ELEM: Element
- IAPRIM=1: Renormalize of radiative stopping power.
- IRAYL=1: Include Rayleigh scattering.
- EFRACH,EFRACL: Electron transport parameter (Necessary)
- IBOUND-IMPACT: Low energy photon flag (Optional)
- FE-RAYLEIGH:Identifier of data. (Used in user code)
- FE(31 col.): Identifier of Fe in density effect table.
- FE(line 5): Atomic Symbol.

Energy Range (MeV)

ENER
&INP AE=0.521, UE=50.511, AP=0.01, UP=50. /

	Lower	Upper	
Electron	AE	UE	Total Energy
Photon	AP	UP	

UE must be as close as possible to incident energy for efficiency of electron transport.
UE >= Incident energy

Xe Gas (STP): Elements, Gas

ELEM

&INP RHO=5.89E-3, GASP=1.0, IAPRIM=1, IRAYL=1,

EFARCH=0.05, EFRACL=0.2 /

XENON-GAS XE-GAS

XE

- RHO: Density (g/cm^3) (at STP[=0ºC, 1atm] for gases).
- "GASP=Gas pressure": Specify materal as "GAS".
- "Gas pressure" is in atm at the natural temperature (0ºC). If the gas temperature is different from 0ºC, calculate and input the pressure of that gas when the gas temperature is changed as the natural temperature while gas volume is not changed.
- XE-GAS(31 col.): Identifier of Xe gas in density effect table.
- XE(line 5): Atomic Symbol.

Acryl: Compound, Solid

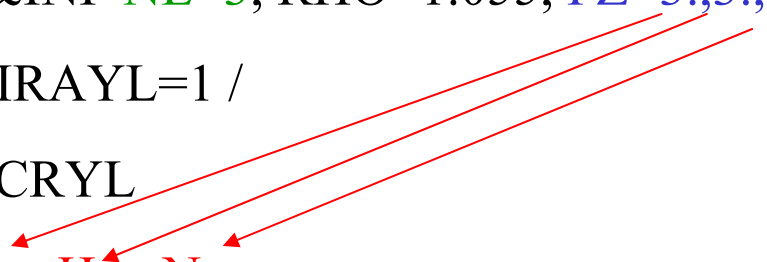
COMP

&INP NE=3, RHO=1.055, PZ=3.,3.,1. ,IAPRIM=1, EFARCH=0.05, EFRACL=0.2,

IRAYL=1 /

ACRYL ACRYL

C H N



- COMP: Compound
- NE=3: 3 elements in compound.
- RHO: Density (g/cm^3).
- PZ: Relative number of atoms.
- ACRYL (31 Col.): Dummy input. Use general formula for density effect calculation.
- Line 5: Atomic Symbol (A2,1X). Same order as PZ.

CO_2 Gas (20ºC, 1atm) : Compound, Gas

COMP

&INP NE=2, RHO=1.977E-3, GASP=0.93174, EFRACH=0.05,EFRACL=0.2,

PZ=1.,2.,IAPRIM=1, IRAYL=1 /

CO2-20C CO2-GAS

C O

- GASP: 0.93174 atm (=273ºC/293ºC).
- This pressure is obtained when a gas of 20ºC and 1 atm is cooled down to 0ºC while the volume remains unchanged.

H_2 Gas (STP): Compound, Gas

```
COMP
  &INP NE=2, RHO=8.99E-5, GASP=1.0,  IAPRIM=1,
  PZ=1.,1., IRAYL=1, EFARCH=0.05, EFRACL=0.2 /
H2-GAS                                        H2-GAS
H     H
```

- Molecular gas (ex. H_2) is treated as compound.
- NE=1 causes error.
- H2-GAS (31 Col.) : Identifier of H_2 gas in density effect table.

Lead Glass: Mixture, Solid

```
MIXT
 &INP NE=5, RHO=3.61, RHOZ=41.8, 21.0, 29.0,
 5.0. 2.2, IAPRIM=1, IRAYL=1, EFARCH=0.05, EFRACL=0.2 /
LEAD GLASS
PB   SI   O    K    NA
```

- MIXT: Mixture.
- NE=5: 5 elements in mixture.
- RHO: Density (g/cm^3).
- RHOZ: Relative amount of atom in mixture (by weight).
- Line 5: Atomic symbol (A2,1X). Same order as RHOZ.

Air (20ºC, 1atm): Mixture, Gas

MIXT

&INP NE=3, RHO=1.2929E-3, GASP=0.93174,

RHOZ=0.75575,0.23143,0.01282, IAPRIM=1,

IRAYL=1, EFRACH=0.05, EFRACL=0.2 /

AIR-20C AIR-GAS

N O AR

- RHO: Density at STP (g/cm^3).
- 20ºC, 1 atm → GASP=0.93174
- Ar is important in low energy.

CALL OPTION

A option to output evaluated value.

Ex. Mean free path of lead for 49.99 MeV photon.

```
ELEM
   &INP  IAPRIM=1 /
PB
PB
CALL
   &INP  XP(1)=49.99 /
GMFP
```

```
OPT=CALL
FUNCTIONCALL:  1.95522  = GMFP  OF 49/9900
```

- GMFP is given in radiation length.

Low energy photon transport flag

- IBOUND =1 (Bound Compton x section)
- INCOH=1 (Angular Dist of Bound Compton)
- ICPROF=-3 (Doppler Broadening)
- IMPACT=1-6 (K shell EII)
- (=0 : ignored)

Revise record

- 22JUL2004 Made for EGS5