```
p + 40Ca elastic
NAMELIST

 &FRESCO  hcm=0.0100 rmatch=60.000 jtmin=0.0 jtmax=35.0
    thmin=0.00 thmax=180.00 thinc=0.500 xstabl= 1
    elab(1)=30  smats=2 /

 &PARTITION namep='p' massp=  1.0000 zp=1
          namet='40Ca   ' masst=40.0000 zt=20 nex=1 qval=  0/

 &STATES jp=0.5 bandp=1 ep=0.0000  cpot=1 jt=0.0 bandt=1 et= 0.0000/

 &partition /

 &pot kp=1 type=0 at=40 rc=1.2 /
 &pot kp=1 type=1 shape=0  v=47.2 vr0=1.172 a=0.703 w=1.78 wr0=1.288 aw=0.653/
 &pot kp=1 type=2 shape=0  wd=4.83 wdr0=1.288 awd=0.653/
 &pot /



 &overlap /
 &coupling /
```

p + 40Ca elastic

Heading (up to 80 characters)

```
NAMELIST

 &FRESCO  hcm=0.0100 rmatch=60.000 jtmin=0.0 jtmax=35.0
    thmin=0.00 thmax=180.00 thinc=0.500 xstabl= 1
    elab(1)=30  smats=2 /

 &PARTITION namep='p' massp=  1.0000 zp=1
          namet='40Ca   ' masst=40.0000 zt=20 nex=1 qval=  0/

 &STATES jp=0.5 bandp=1 ep=0.0000  cpot=1 jt=0.0 bandt=1 et= 0.0000/

 &partition /

 &pot kp=1 type=0 at=40 rc=1.2 /
 &pot kp=1 type=1 shape=0  v=47.2 vr0=1.172 a=0.703 w=1.78 wr0=1.288 aw=0.653/
 &pot kp=1 type=2 shape=0  wd=4.83 wdr0=1.288 awd=0.653/
 &pot /



 &overlap /
 &coupling /
```

p + 40Ca elastic
NAMELIST

Always follows the heading to indicate the subsequent style of input

```
&FRESCO  hcm=0.0100 rmatch=60.000 jtmin=0.0 jtmax=35.0
   thmin=0.00 thmax=180.00 thinc=0.500 xstabl= 1
   elab(1)=30  smats=2 /

&PARTITION namep='p' massp=  1.0000 zp=1
         namet='40Ca   ' masst=40.0000 zt=20 nex=1 qval=  0/

&STATES jp=0.5 bandp=1 ep=0.0000  cpot=1 jt=0.0 bandt=1 et= 0.0000/

&partition /

&pot kp=1 type=0 at=40 rc=1.2 /
&pot kp=1 type=1 shape=0  v=47.2 vr0=1.172 a=0.703 w=1.78 wr0=1.288 aw=0.653/
&pot kp=1 type=2 shape=0  wd=4.83 wdr0=1.288 awd=0.653/
&pot /



&overlap /
&coupling /
```

p + 40Ca elastic
NAMELIST

This section introduces the parameters involved in the numerical calculations

```
&FRESCO hcm=0.0100 rmatch=60.000 jtmin=0.0 jtmax=35.0
   thmin=0.00 thmax=180.00 thinc=0.500 xstabl= 1
   elab(1)=30  smats=2 /

&PARTITION namep='p' massp=  1.0000 zp=1
        namet='40Ca   ' masst=40.0000 zt=20 nex=1 qval=  0/

&STATES jp=0.5 bandp=1 ep=0.0000  cpot=1 jt=0.0 bandt=1 et= 0.0000/

&partition /

&pot kp=1 type=0 at=40 rc=1.2 /
&pot kp=1 type=1 shape=0  v=47.2 vr0=1.172 a=0.703 w=1.78 wr0=1.288 aw=0.653/
&pot kp=1 type=2 shape=0  wd=4.83 wdr0=1.288 awd=0.653/
&pot /


&overlap /
&coupling /
```

p + 40Ca elastic
NAMELIST

the step with which the coupled-channel equations are integrated

```
&FRESCO hcm=0.0100 rmatch=60.000 jtmin=0.0 jtmax=35.0
   thmin=0.00 thmax=180.00 thinc=0.500 xstabl= 1
   elab(1)=30  smats=2 /

&PARTITION namep='p' massp=  1.0000 zp=1
         namet='40Ca   ' masst=40.0000 zt=20 nex=1 qval=  0/

&STATES jp=0.5 bandp=1 ep=0.0000  cpot=1 jt=0.0 bandt=1 et= 0.0000/

&partition /

&pot kp=1 type=0 at=40 rc=1.2 /
&pot kp=1 type=1 shape=0  v=47.2 vr0=1.172 a=0.703 w=1.78 wr0=1.288 aw=0.653/
&pot kp=1 type=2 shape=0  wd=4.83 wdr0=1.288 awd=0.653/
&pot /



&overlap /
&coupling /
```

p + 40Ca elastic
NAMELIST

the radius at which the integrated wave function gets matched to the asymptotic form

```
&FRESCO  hcm=0.0100 rmatch=60.000 jtmin=0.0 jtmax=35.0
   thmin=0.00 thmax=180.00 thinc=0.500 xstabl= 1
   elab(1)=30  smats=2 /

&PARTITION namep='p' massp=  1.0000 zp=1
         namet='40Ca   ' masst=40.0000 zt=20 nex=1 qval=  0/

&STATES jp=0.5 bandp=1 ep=0.0000  cpot=1 jt=0.0 bandt=1 et= 0.0000/

&partition /

&pot kp=1 type=0 at=40 rc=1.2 /
&pot kp=1 type=1 shape=0  v=47.2 vr0=1.172 a=0.703 w=1.78 wr0=1.288 aw=0.653/
&pot kp=1 type=2 shape=0  wd=4.83 wdr0=1.288 awd=0.653/
&pot /



&overlap /
&coupling /
```

p + 40Ca elastic
NAMELIST

Minimum and maximum partial waves

```
&FRESCO  hcm=0.0100 rmatch=60.000 jtmin=0.0 jtmax=35.0
   thmin=0.00 thmax=180.00 thinc=0.500 xstabl= 1
   elab(1)=30  smats=2 /

&PARTITION namep='p' massp=  1.0000 zp=1
         namet='40Ca   ' masst=40.0000 zt=20 nex=1 qval=  0/

&STATES jp=0.5 bandp=1 ep=0.0000  cpot=1 jt=0.0 bandt=1 et= 0.0000/

&partition /

&pot kp=1 type=0 at=40 rc=1.2 /
&pot kp=1 type=1 shape=0  v=47.2 vr0=1.172 a=0.703 w=1.78 wr0=1.288 aw=0.653/
&pot kp=1 type=2 shape=0  wd=4.83 wdr0=1.288 awd=0.653/
&pot /



&overlap /
&coupling /
```

p + 40Ca elastic
NAMELIST

Minimum and maximum scattering angles for the angular range of cross sections

```
&FRESCO  hcm=0.0100 rmatch=60.000 jtmin=0.0 jtmax=35.0
  thmin=0.00 thmax=180.00 thinc=0.500 xstabl= 1
   elab(1)=30  smats=2 /

&PARTITION namep='p' massp=  1.0000 zp=1
        namet='40Ca   ' masst=40.0000 zt=20 nex=1 qval=  0/

&STATES jp=0.5 bandp=1 ep=0.0000  cpot=1 jt=0.0 bandt=1 et= 0.0000/

&partition /

&pot kp=1 type=0 at=40 rc=1.2 /
&pot kp=1 type=1 shape=0  v=47.2 vr0=1.172 a=0.703 w=1.78 wr0=1.288 aw=0.653/
&pot kp=1 type=2 shape=0  wd=4.83 wdr0=1.288 awd=0.653/
&pot /



&overlap /
&coupling /
```

The step of the scattering angle change

p + 40Ca elastic
NAMELIST

```
&FRESCO  hcm=0.0100 rmatch=60.000 jtmin=0.0 jtmax=35.0
   thmin=0.00 thmax=180.00 thinc=0.500 xstabl= 1
   elab(1)=30  smats=2 /

&PARTITION namep='p' massp=  1.0000 zp=1
         namet='40Ca   ' masst=40.0000 zt=20 nex=1 qval=  0/

&STATES jp=0.5 bandp=1 ep=0.0000  cpot=1 jt=0.0 bandt=1 et= 0.0000/

&partition /

&pot kp=1 type=0 at=40 rc=1.2 /
&pot kp=1 type=1 shape=0  v=47.2 vr0=1.172 a=0.703 w=1.78 wr0=1.288 aw=0.653/
&pot kp=1 type=2 shape=0  wd=4.83 wdr0=1.288 awd=0.653/
&pot /


&overlap /
&coupling /
```

p + 40Ca elastic
NAMELIST

prints the cross sections and tensor analyzing powers up to rank k=xstabl for all excitation levels in all partitions in fort.16

```
&FRESCO  hcm=0.0100 rmatch=60.000 jtmin=0.0 jtmax=35.0
   thmin=0.00 thmax=180.00 thinc=0.500 xstabl= 1
   elab(1)=30  smats=2 /

&PARTITION namep='p' massp=  1.0000 zp=1
         namet='40Ca   ' masst=40.0000 zt=20 nex=1 qval=  0/

&STATES jp=0.5 bandp=1 ep=0.0000  cpot=1 jt=0.0 bandt=1 et= 0.0000/

&partition /

&pot kp=1 type=0 at=40 rc=1.2 /
&pot kp=1 type=1 shape=0  v=47.2 vr0=1.172 a=0.703 w=1.78 wr0=1.288 aw=0.653/
&pot kp=1 type=2 shape=0  wd=4.83 wdr0=1.288 awd=0.653/
&pot /



&overlap /
&coupling /
```

Projectile energy in lab coordinates (MeV)

```
p + 40Ca elastic
NAMELIST

 &FRESCO  hcm=0.0100 rmatch=60.000 jtmin=0.0 jtmax=35.0
    thmin=0.00 thmax=180.00 thinc=0.500 xstabl= 1
    elab(1)=30  smats=2 /

 &PARTITION namep='p' massp=  1.0000 zp=1
          namet='40Ca   ' masst=40.0000 zt=20 nex=1 qval=  0/

 &STATES jp=0.5 bandp=1 ep=0.0000  cpot=1 jt=0.0 bandt=1 et= 0.0000/

 &partition /

 &pot kp=1 type=0 at=40 rc=1.2 /
 &pot kp=1 type=1 shape=0  v=47.2 vr0=1.172 a=0.703 w=1.78 wr0=1.288 aw=0.653/
 &pot kp=1 type=2 shape=0  wd=4.83 wdr0=1.288 awd=0.653/
 &pot /



 &overlap /
 &coupling /
```

p + 40Ca elastic
NAMELIST

Elastic S-matrix elements are output when smats>=2

The / at the end indicates end of section

```
&FRESCO  hcm=0.0100 rmatch=60.000 jtmin=0.0 jtmax=35.0
   thmin=0.00 thmax=180.00 thinc=0.500 xstabl= 1
   elab(1)=30 smats=2 /

&PARTITION namep='p' massp=  1.0000 zp=1
         namet='40Ca   ' masst=40.0000 zt=20 nex=1 qval=  0/

&STATES jp=0.5 bandp=1 ep=0.0000  cpot=1 jt=0.0 bandt=1 et= 0.0000/

&partition /

&pot kp=1 type=0 at=40 rc=1.2 /
&pot kp=1 type=1 shape=0  v=47.2 vr0=1.172 a=0.703 w=1.78 wr0=1.288 aw=0.653/
&pot kp=1 type=2 shape=0  wd=4.83 wdr0=1.288 awd=0.653/
&pot /



&overlap /
&coupling /
```

p + 40Ca elastic
NAMELIST

In partition you introduce all the mass partitions and the corresponding channels

```
&FRESCO  hcm=0.0100 rmatch=60.000 jtmin=0.0 jtmax=35.0
   thmin=0.00 thmax=180.00 thinc=0.500 xstabl= 1
   elab(1)=30  smats=2 /

&PARTITION namep='p' massp=  1.0000 zp=1
         namet='40Ca   ' masst=40.0000 zt=20 nex=1 qval=  0/

&STATES jp=0.5 bandp=1 ep=0.0000  cpot=1 jt=0.0 bandt=1 et= 0.0000/

&partition /

&pot kp=1 type=0 at=40 rc=1.2 /
&pot kp=1 type=1 shape=0  v=47.2 vr0=1.172 a=0.703 w=1.78 wr0=1.288 aw=0.653/
&pot kp=1 type=2 shape=0  wd=4.83 wdr0=1.288 awd=0.653/
&pot /



&overlap /
&coupling /
```

Name, mass and proton number of the projectile

```
p + 40Ca elastic
NAMELIST

 &FRESCO  hcm=0.0100 rmatch=60.000 jtmin=0.0 jtmax=35.0
    thmin=0.00 thmax=180.00 thinc=0.500 xstabl= 1
    elab(1)=30  smats=2 /

 &PARTITION namep='p' massp=  1.0000 zp=1
          namet='40Ca    ' masst=40.0000 zt=20 nex=1 qval=  0/

 &STATES jp=0.5 bandp=1 ep=0.0000  cpot=1 jt=0.0 bandt=1 et= 0.0000/

 &partition /

 &pot kp=1 type=0 at=40 rc=1.2 /
 &pot kp=1 type=1 shape=0  v=47.2 vr0=1.172 a=0.703 w=1.78 wr0=1.288 aw=0.653/
 &pot kp=1 type=2 shape=0  wd=4.83 wdr0=1.288 awd=0.653/
 &pot /



 &overlap /
 &coupling /
```

Name, mass and proton number of the target

```
p + 40Ca elastic
NAMELIST

 &FRESCO  hcm=0.0100 rmatch=60.000 jtmin=0.0 jtmax=35.0
    thmin=0.00 thmax=180.00 thinc=0.500 xstabl= 1
    elab(1)=30  smats=2 /

 &PARTITION namep='p' massp=  1.0000 zp=1
         namet='40Ca   ' masst=40.0000 zt=20 nex=1 qval=  0/

 &STATES jp=0.5 bandp=1 ep=0.0000  cpot=1 jt=0.0 bandt=1 et= 0.0000/

 &partition /

 &pot kp=1 type=0 at=40 rc=1.2 /
 &pot kp=1 type=1 shape=0  v=47.2 vr0=1.172 a=0.703 w=1.78 wr0=1.288 aw=0.653/
 &pot kp=1 type=2 shape=0  wd=4.83 wdr0=1.288 awd=0.653/
 &pot /



 &overlap /
 &coupling /
```

number of states that you want to include in this partition

p + 40Ca elastic
NAMELIST

```
&FRESCO  hcm=0.0100 rmatch=60.000 jtmin=0.0 jtmax=35.0
   thmin=0.00 thmax=180.00 thinc=0.500 xstabl= 1
   elab(1)=30  smats=2 /

&PARTITION namep='p' massp=  1.0000 zp=1
         namet='40Ca   ' masst=40.0000 zt=20 nex=1 qval=  0/

&STATES jp=0.5 bandp=1 ep=0.0000  cpot=1 jt=0.0 bandt=1 et= 0.0000/

&partition /

&pot kp=1 type=0 at=40 rc=1.2 /
&pot kp=1 type=1 shape=0  v=47.2 vr0=1.172 a=0.703 w=1.78 wr0=1.288 aw=0.653/
&pot kp=1 type=2 shape=0  wd=4.83 wdr0=1.288 awd=0.653/
&pot /



&overlap /
&coupling /
```

Q value of the reaction (0 for elastic scattering)

```
p + 40Ca elastic
NAMELIST

 &FRESCO  hcm=0.0100 rmatch=60.000 jtmin=0.0 jtmax=35.0
    thmin=0.00 thmax=180.00 thinc=0.500 xstabl= 1
    elab(1)=30  smats=2 /

 &PARTITION namep='p' massp=  1.0000 zp=1
          namet='40Ca   ' masst=40.0000 zt=20 nex=1 qval=  0/

 &STATES jp=0.5 bandp=1 ep=0.0000  cpot=1 jt=0.0 bandt=1 et= 0.0000/

 &partition /

 &pot kp=1 type=0 at=40 rc=1.2 /
 &pot kp=1 type=1 shape=0  v=47.2 vr0=1.172 a=0.703 w=1.78 wr0=1.288 aw=0.653/
 &pot kp=1 type=2 shape=0  wd=4.83 wdr0=1.288 awd=0.653/
 &pot /



 &overlap /
 &coupling /
```

p + 40Ca elastic
NAMELIST

Each pair of states is a specific combination of one state of the projectile and one state of the target

```
&FRESCO  hcm=0.0100 rmatch=60.000 jtmin=0.0 jtmax=35.0
   thmin=0.00 thmax=180.00 thinc=0.500 xstabl= 1
   elab(1)=30  smats=2 /

&PARTITION namep='p' massp=  1.0000 zp=1
        namet='40Ca   ' masst=40.0000 zt=20 nex=1 qval=  0/

&STATES jp=0.5 bandp=1 ep=0.0000  cpot=1 jt=0.0 bandt=1 et= 0.0000/

&partition /

&pot kp=1 type=0 at=40 rc=1.2 /
&pot kp=1 type=1 shape=0  v=47.2 vr0=1.172 a=0.703 w=1.78 wr0=1.288 aw=0.653/
&pot kp=1 type=2 shape=0  wd=4.83 wdr0=1.288 awd=0.653/
&pot /



&overlap /
&coupling /
```

Spin, parity and excitation energy of the projectile

p + 40Ca elastic
NAMELIST

```
&FRESCO  hcm=0.0100 rmatch=60.000 jtmin=0.0 jtmax=35.0
   thmin=0.00 thmax=180.00 thinc=0.500 xstabl= 1
   elab(1)=30  smats=2 /

&PARTITION namep='p' massp=  1.0000 zp=1
        namet='40Ca   ' masst=40.0000 zt=20 nex=1 qval=  0/

&STATES jp=0.5 bandp=1 ep=0.0000  cpot=1 jt=0.0 bandt=1 et= 0.0000/

&partition /

&pot kp=1 type=0 at=40 rc=1.2 /
&pot kp=1 type=1 shape=0  v=47.2 vr0=1.172 a=0.703 w=1.78 wr0=1.288 aw=0.653/
&pot kp=1 type=2 shape=0  wd=4.83 wdr0=1.288 awd=0.653/
&pot /


&overlap /
&coupling /
```

p + 40Ca elastic
NAMELIST

The optical potential for the distorted wave for projectile + target relative motion is given by the index cpot

```
&FRESCO  hcm=0.0100 rmatch=60.000 jtmin=0.0 jtmax=35.0
   thmin=0.00 thmax=180.00 thinc=0.500 xstabl= 1
   elab(1)=30  smats=2 /

&PARTITION namep='p' massp=  1.0000 zp=1
         namet='40Ca   ' masst=40.0000 zt=20 nex=1 qval=  0/

&STATES jp=0.5 bandp=1 ep=0.0000  cpot=1 jt=0.0 bandt=1 et= 0.0000/

&partition /

&pot kp=1 type=0 at=40 rc=1.2 /
&pot kp=1 type=1 shape=0  v=47.2 vr0=1.172 a=0.703 w=1.78 wr0=1.288 aw=0.653/
&pot kp=1 type=2 shape=0  wd=4.83 wdr0=1.288 awd=0.653/
&pot /


&overlap /
&coupling /
```

p + 40Ca elastic
NAMELIST

Spin, parity and excitation energy of the target

```
&FRESCO  hcm=0.0100 rmatch=60.000 jtmin=0.0 jtmax=35.0
   thmin=0.00 thmax=180.00 thinc=0.500 xstabl= 1
   elab(1)=30  smats=2 /

&PARTITION namep='p' massp=  1.0000 zp=1
         namet='40Ca   ' masst=40.0000 zt=20 nex=1 qval=  0/

&STATES jp=0.5 bandp=1 ep=0.0000  cpot=1 jt=0.0 bandt=1 et= 0.0000/

&partition /

&pot kp=1 type=0 at=40 rc=1.2 /
&pot kp=1 type=1 shape=0  v=47.2 vr0=1.172 a=0.703 w=1.78 wr0=1.288 aw=0.653/
&pot kp=1 type=2 shape=0  wd=4.83 wdr0=1.288 awd=0.653/
&pot /


&overlap /
&coupling /
```

This namelist contains the parameters for the potentials to be used in the reaction calculation

p + 40Ca elastic
NAMELIST

```
&FRESCO  hcm=0.0100 rmatch=60.000 jtmin=0.0 jtmax=35.0
   thmin=0.00 thmax=180.00 thinc=0.500 xstabl= 1
   elab(1)=30  smats=2 /

&PARTITION namep='p' massp=  1.0000 zp=1
         namet='40Ca   ' masst=40.0000 zt=20 nex=1 qval=  0/

&STATES jp=0.5 bandp=1 ep=0.0000  cpot=1 jt=0.0 bandt=1 et= 0.0000/

&partition /

&pot kp=1 type=0 at=40 rc=1.2 /
&pot kp=1 type=1 shape=0  v=47.2 vr0=1.172 a=0.703 w=1.78 wr0=1.288 aw=0.653/
&pot kp=1 type=2 shape=0  wd=4.83 wdr0=1.288 awd=0.653/
&pot /


&overlap /
&coupling /
```

p + 40Ca elastic
NAMELIST

kp enumerates the potentials. All the components with a given kp are added together to produce the total potential used

```
&FRESCO  hcm=0.0100 rmatch=60.000 jtmin=0.0 jtmax=35.0
   thmin=0.00 thmax=180.00 thinc=0.500 xstabl= 1
   elab(1)=30  smats=2 /

&PARTITION namep='p' massp=  1.0000 zp=1
         namet='40Ca  ' masst=40.0000 zt=20 nex=1 qval=  0/

&STATES jp=0.5 bandp=1 ep=0.0000  cpot=1 jt=0.0 bandt=1 et= 0.0000/

&partition /

&pot kp=1 type=0 at=40 rc=1.2 /
&pot kp=1 type=1 shape=0  v=47.2 vr0=1.172 a=0.703 w=1.78 wr0=1.288 aw=0.653/
&pot kp=1 type=2 shape=0  wd=4.83 wdr0=1.288 awd=0.653/
&pot /


&overlap /
&coupling /
```

Type of the potential: type=0 is Coulomb

p + 40Ca elastic
NAMELIST

```
&FRESCO  hcm=0.0100 rmatch=60.000 jtmin=0.0 jtmax=35.0
   thmin=0.00 thmax=180.00 thinc=0.500 xstabl= 1
   elab(1)=30  smats=2 /

&PARTITION namep='p' massp=  1.0000 zp=1
         namet='40Ca   ' masst=40.0000 zt=20 nex=1 qval=  0/

&STATES jp=0.5 bandp=1 ep=0.0000  cpot=1 jt=0.0 bandt=1 et= 0.0000/

&partition /

&pot kp=1 type=0 at=40 rc=1.2 /
&pot kp=1 type=1 shape=0  v=47.2 vr0=1.172 a=0.703 w=1.78 wr0=1.288 aw=0.653/
&pot kp=1 type=2 shape=0  wd=4.83 wdr0=1.288 awd=0.653/
&pot /


&overlap /
&coupling /
```

p + 40Ca elastic
NAMELIST

Mass of the target and rc to calculate Coulomb radius

$R = rc * A^{1/3}$

```
&FRESCO  hcm=0.0100 rmatch=60.000 jtmin=0.0 jtmax=35.0
   thmin=0.00 thmax=180.00 thinc=0.500 xstabl= 1
   elab(1)=30  smats=2 /

&PARTITION namep='p' massp=  1.0000 zp=1
         namet='40Ca   ' masst=40.0000 zt=20 nex=1 qval=  0/

&STATES jp=0.5 bandp=1 ep=0.0000  cpot=1 jt=0.0 bandt=1 et= 0.0000/

&partition /

&pot kp=1 type=0 at=40 rc=1.2 /
&pot kp=1 type=1 shape=0  v=47.2 vr0=1.172 a=0.703 w=1.78 wr0=1.288 aw=0.653/
&pot kp=1 type=2 shape=0  wd=4.83 wdr0=1.288 awd=0.653/
&pot /


&overlap /
&coupling /
```

Type of the potential: type=1 is the volume potential

p + 40Ca elastic
NAMELIST

```
&FRESCO  hcm=0.0100 rmatch=60.000 jtmin=0.0 jtmax=35.0
   thmin=0.00 thmax=180.00 thinc=0.500 xstabl= 1
   elab(1)=30  smats=2 /

&PARTITION namep='p' massp=  1.0000 zp=1
         namet='40Ca   ' masst=40.0000 zt=20 nex=1 qval=  0/

&STATES jp=0.5 bandp=1 ep=0.0000  cpot=1 jt=0.0 bandt=1 et= 0.0000/

&partition /

&pot kp=1 type=0 at=40 rc=1.2 /
&pot kp=1 type=1 shape=0  v=47.2 vr0=1.172 a=0.703 w=1.78 wr0=1.288 aw=0.653/
&pot kp=1 type=2 shape=0  wd=4.83 wdr0=1.288 awd=0.653/
&pot /


&overlap /
&coupling /
```

p + 40Ca elastic
NAMELIST

Type of the potential: type=1 shape=0 is volume Woods-Saxon

```
&FRESCO  hcm=0.0100 rmatch=60.000 jtmin=0.0 jtmax=35.0
   thmin=0.00 thmax=180.00 thinc=0.500 xstabl= 1
   elab(1)=30  smats=2 /

&PARTITION namep='p' massp=  1.0000 zp=1
         namet='40Ca   ' masst=40.0000 zt=20 nex=1 qval=  0/

&STATES jp=0.5 bandp=1 ep=0.0000  cpot=1 jt=0.0 bandt=1 et= 0.0000/

&partition /

&pot kp=1 type=0 at=40 rc=1.2 /
&pot kp=1 type=1 shape=0  v=47.2 vr0=1.172 a=0.703 w=1.78 wr0=1.288 aw=0.653/
&pot kp=1 type=2 shape=0  wd=4.83 wdr0=1.288 awd=0.653/
&pot /



&overlap /
&coupling /
```

p + 40Ca elastic
NAMELIST

Woods-Saxon parameters (depth, reduced radius and diffuseness) for the real (first 3) and imaginary parts (last 3)

```
&FRESCO  hcm=0.0100 rmatch=60.000 jtmin=0.0 jtmax=35.0
   thmin=0.00 thmax=180.00 thinc=0.500 xstabl= 1
   elab(1)=30  smats=2 /

&PARTITION namep='p' massp=  1.0000 zp=1
         namet='40Ca   ' masst=40.0000 zt=20 nex=1 qval=  0/

&STATES jp=0.5 bandp=1 ep=0.0000  cpot=1 jt=0.0 bandt=1 et= 0.0000/

&partition /

&pot kp=1 type=0 at=40 rc=1.2 /
&pot kp=1 type=1 shape=0  v=47.2 vr0=1.172 a=0.703 w=1.78 wr0=1.288 aw=0.653/
&pot kp=1 type=2 shape=0  wd=4.83 wdr0=1.288 awd=0.653/
&pot /


&overlap /
&coupling /
```

Type of the potential: type=2 shape=0 is surface Woods-Saxon

p + 40Ca elastic
NAMELIST

```
&FRESCO  hcm=0.0100 rmatch=60.000 jtmin=0.0 jtmax=35.0
   thmin=0.00 thmax=180.00 thinc=0.500 xstabl= 1
   elab(1)=30  smats=2 /

&PARTITION namep='p' massp=  1.0000 zp=1
         namet='40Ca   ' masst=40.0000 zt=20 nex=1 qval=  0/

&STATES jp=0.5 bandp=1 ep=0.0000  cpot=1 jt=0.0 bandt=1 et= 0.0000/

&partition /

&pot kp=1 type=0 at=40 rc=1.2 /
&pot kp=1 type=1 shape=0  v=47.2 vr0=1.172 a=0.703 w=1.78 wr0=1.288 aw=0.653/
&pot kp=1 type=2 shape=0  wd=4.83 wdr0=1.288 awd=0.653/
&pot /


&overlap /
&coupling /
```

p + 40Ca elastic
NAMELIST

Woods-Saxon derivative parameters (depth, reduced radius and diffuseness) for the imaginary part

```
&FRESCO  hcm=0.0100 rmatch=60.000 jtmin=0.0 jtmax=35.0
   thmin=0.00 thmax=180.00 thinc=0.500 xstabl= 1
   elab(1)=30  smats=2 /

&PARTITION namep='p' massp=  1.0000 zp=1
         namet='40Ca   ' masst=40.0000 zt=20 nex=1 qval=  0/

&STATES jp=0.5 bandp=1 ep=0.0000  cpot=1 jt=0.0 bandt=1 et= 0.0000/

&partition /

&pot kp=1 type=0 at=40 rc=1.2 /
&pot kp=1 type=1 shape=0  v=47.2 vr0=1.172 a=0.703 w=1.78 wr0=1.288 aw=0.653/
&pot kp=1 type=2 shape=0 wd=4.83 wdr0=1.288 awd=0.653/
&pot /



&overlap /
&coupling /
```

p + 40Ca elastic
NAMELIST

Overlap functions are needed in single-particle excitation calculations or in transfer calculations.

```
&FRESCO  hcm=0.0100 rmatch=60.000 jtmin=0.0 jtmax=35.0
   thmin=0.00 thmax=180.00 thinc=0.500 xstabl= 1
   elab(1)=30  smats=2 /

&PARTITION namep='p' massp=  1.0000 zp=1
         namet='40Ca   ' masst=40.0000 zt=20 nex=1 qval=  0/

&STATES jp=0.5 bandp=1 ep=0.0000  cpot=1 jt=0.0 bandt=1 et= 0.0000/

&partition /

&pot kp=1 type=0 at=40 rc=1.2 /
&pot kp=1 type=1 shape=0  v=47.2 vr0=1.172 a=0.703 w=1.78 wr0=1.288 aw=0.653/
&pot kp=1 type=2 shape=0  wd=4.83 wdr0=1.288 awd=0.653/
&pot /


&overlap /
&coupling /
```

p + 40Ca elastic
NAMELIST

Couplings are calculated with the information given in this namelist

```
&FRESCO  hcm=0.0100 rmatch=60.000 jtmin=0.0 jtmax=35.0
   thmin=0.00 thmax=180.00 thinc=0.500 xstabl= 1
   elab(1)=30  smats=2 /

&PARTITION namep='p' massp=  1.0000 zp=1
         namet='40Ca   ' masst=40.0000 zt=20 nex=1 qval=  0/

&STATES jp=0.5 bandp=1 ep=0.0000  cpot=1 jt=0.0 bandt=1 et= 0.0000/

&partition /

&pot kp=1 type=0 at=40 rc=1.2 /
&pot kp=1 type=1 shape=0  v=47.2 vr0=1.172 a=0.703 w=1.78 wr0=1.288 aw=0.653/
&pot kp=1 type=2 shape=0  wd=4.83 wdr0=1.288 awd=0.653/
&pot /



&overlap /
&coupling /
```