$^{11}\mathrm{Li}(p,p)^{11}\mathrm{Li}$

t

$^{11}\mathrm{Li}$

elastic
scattering

$^{10}\mathrm{Li}$

d

p

(a)

t_{10}

p1/2

t_9

v_{np}

p1/2

d

t_8

v_{np}

v_{np}

t_7

p1/2

s1/2

1^-

t_6

t_5

p1/2

2^+

p1/2

t_4

d5/2

t_3

2^+

s1/2

s1/2

s1/2

t_2

p3/2

t_1

γ

π π

t

$^9\mathrm{Li}(1/2^-)$

v_{np}

2^+

d

v_{np}

p

$^9\mathrm{Li}$ 0^+_ν

$^{11}\mathrm{Li}$

p

(b)

$^9\mathrm{Li}$ 0^+_ν

$^{11}\mathrm{Li}$

$^{11}\mathrm{Li}$

p

neutron pair halo

neutron
proton } bound

deuteron
continuum
proton
continuum

particle-vibration
coupling vertex

$_2{+}$ $^9\mathrm{Li}$ core quadr.
vibr. mode

particle-pair vibration
coupling vertex

$_1{-}$ $^{11}\mathrm{Li}$ giant dipole pygmy
resonance mode

monopole
interaction

v_{np} proton-neutron int.

recoil mode

particle-recoil mode
coupling vertex (PRCV)