Dark

Probe

Conduction band

Valence band

E_F

k space

k space

DARK
Optical absorption (no pump)

A_{np}

E_g

Energy

Pump

Probe

E_F^n

Quasi Fermi levels

E_F^p

k space

k space

LIGHT
Optical absorption (pump)

A_p

E_g

Energy

Differential absorption

ΔA

Photo-induced absorption

Ground-state bleach

Energy