Photon-assisted transport and gain clamping

Photon-assisted transport

Photon-assisted transport can be considered

Photon-assisted transport can be modeled by considering electromagnetic (EM) modes at specific energies.

```
<EMfield>
<EMmode>
<PhotonEnergy unit="mV">253.0</PhotonEnergy>
</EMmode>
</EMfield>
```

Note that in the current version (2020-11-16), only a single EM mode is supported at a time.

The electric field in this EM mode can be either imposed (detection mode) or calculated self-consistently (gain clamping).

The detection mode is relevant to study quantum cascade detectors and/or to study the role of photon-assisted transport.

The electric field can be set in the following way: <EMfield> <EMmode> <PhotonEnergy unit="mV">253.0</PhotonEnergy> <ElectricField unit="V.m^-1">1.0e6</ElectricField> </EMmode>

Relation to gain calculation

The gain feature calculates the linear response to an a.c. incoming field. In this case, the d.c. current is not modified. On the other hand, the photon-assisted transport is modeled through the use of a self-energy to describe the influence of absorption and stimulated emission on d.c. transport.

Gain clamping

Gain clamping is relevant to