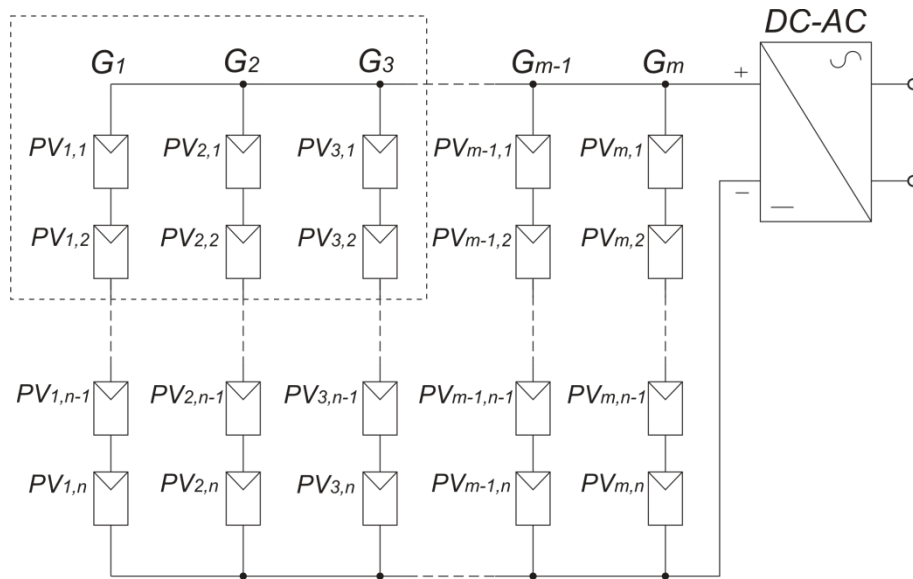
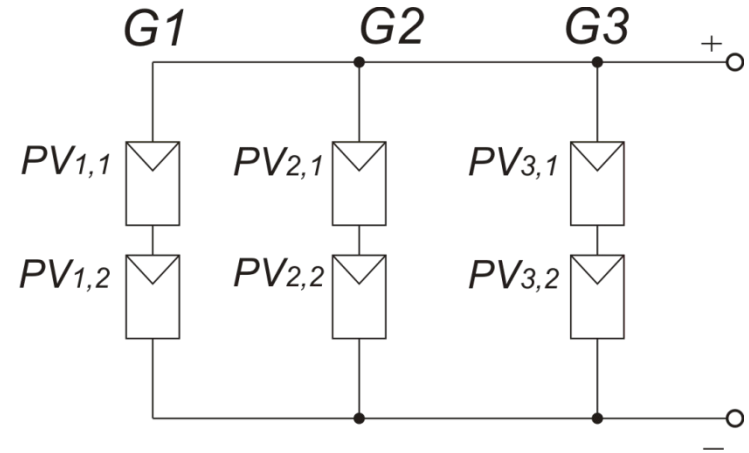


2. Maximum power point tracking

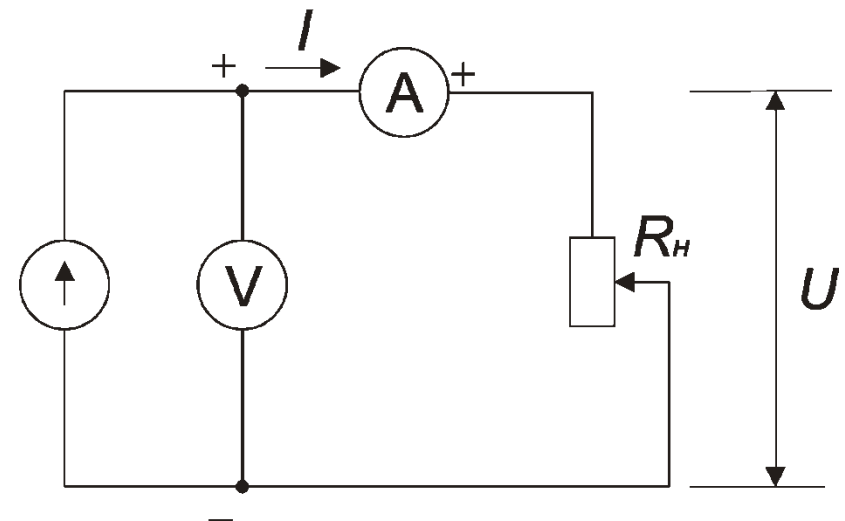
- PV Power Plant configuration



- Part of PVPP for researching



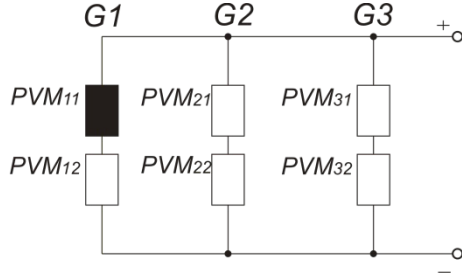
- Research facility



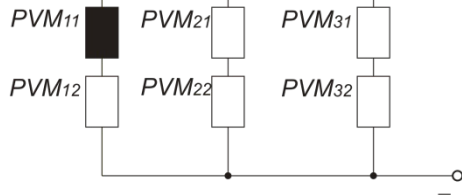
2. MPPT. Partial Shading Research

• Shading cases

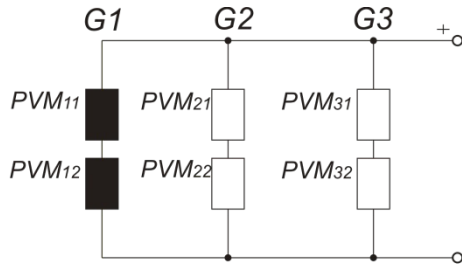
1. — Unshaded



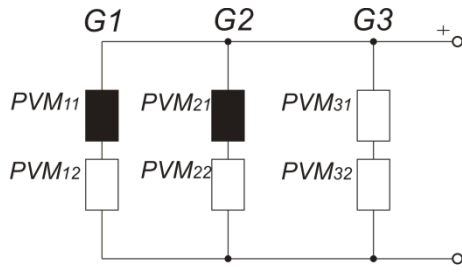
2. —



3. —

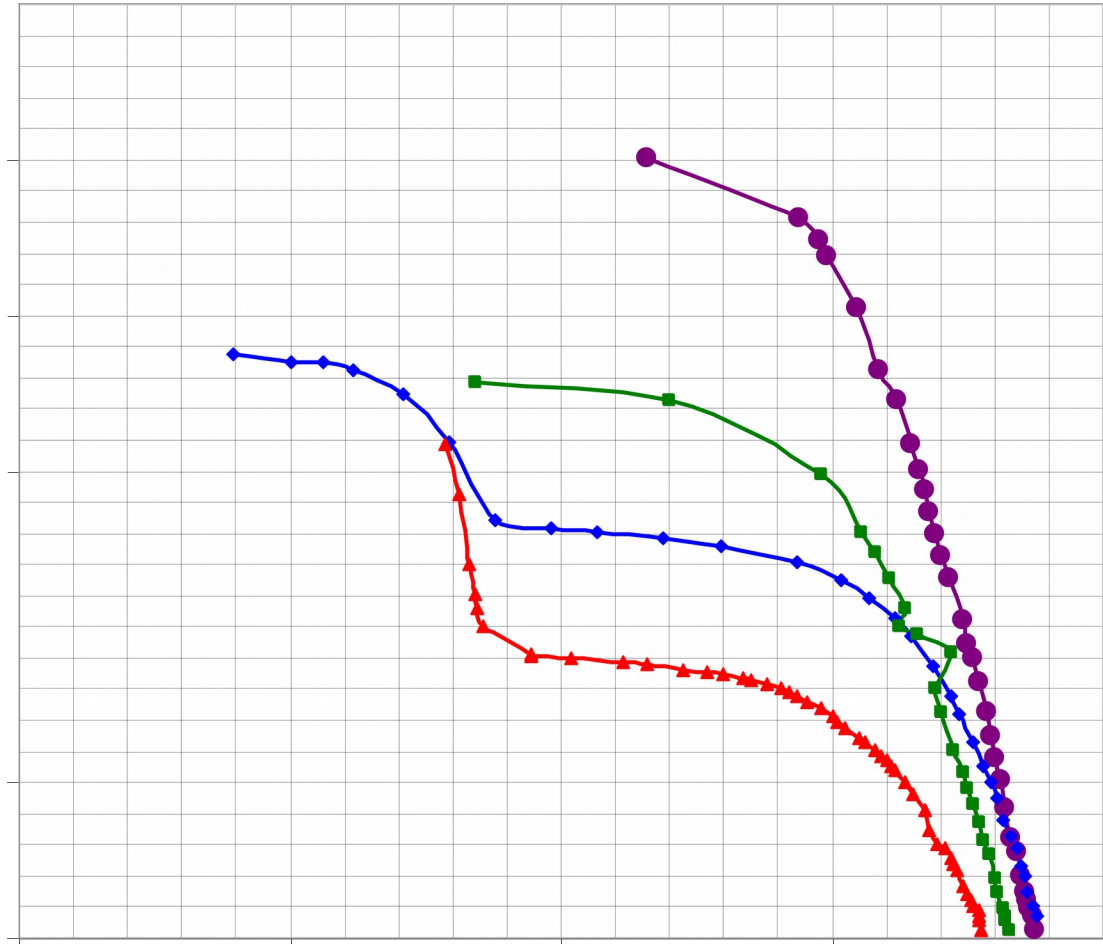


4. —



V-I char

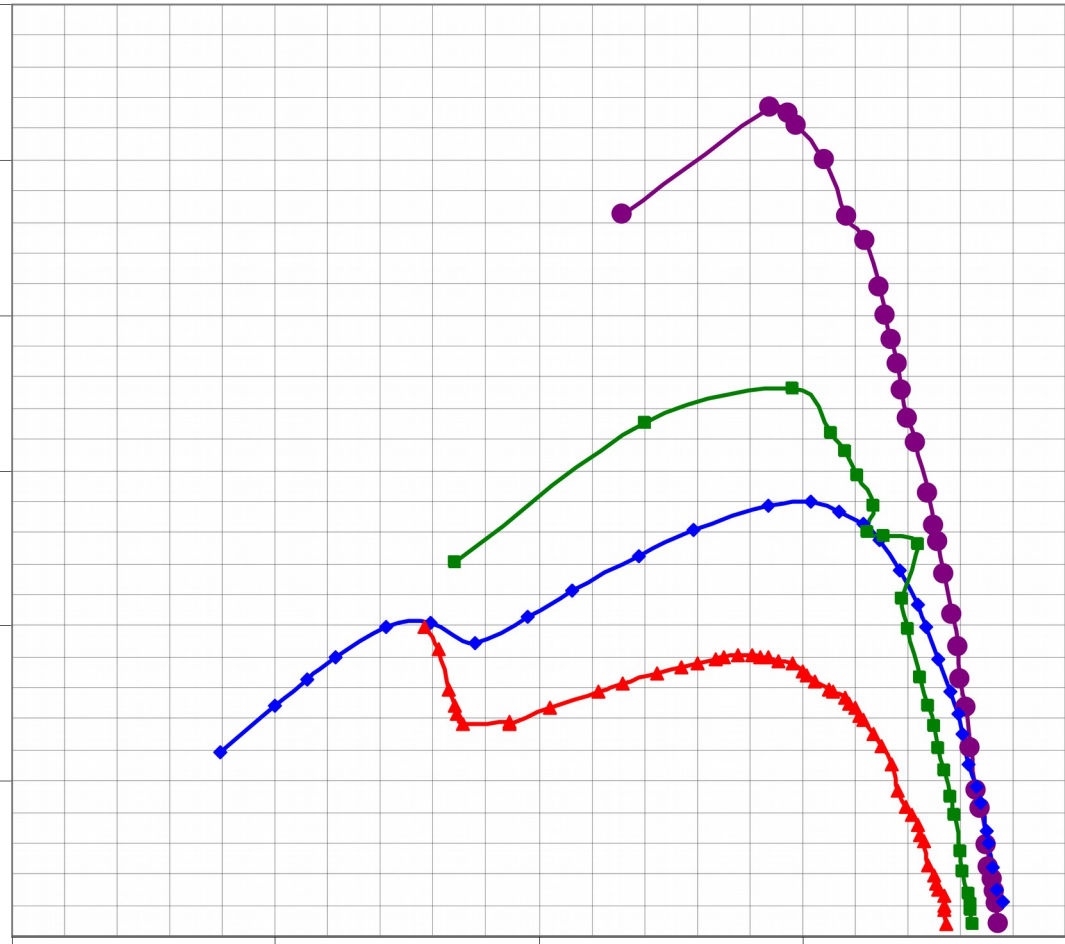
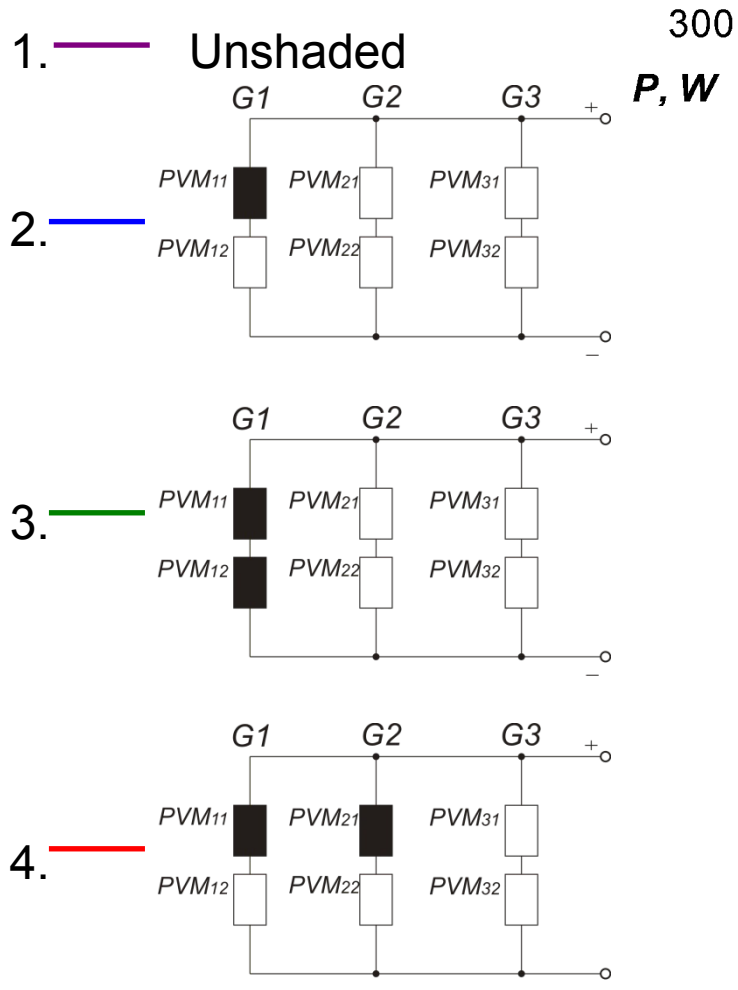
12
 I, A



2. MPPT. Partial Shading Research

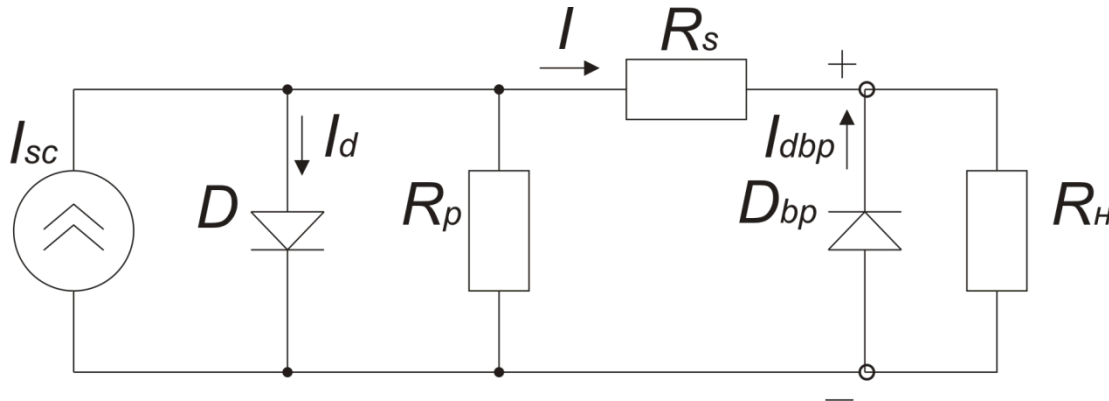
Shading cases

V-P cha



2. MPPT. Modelling

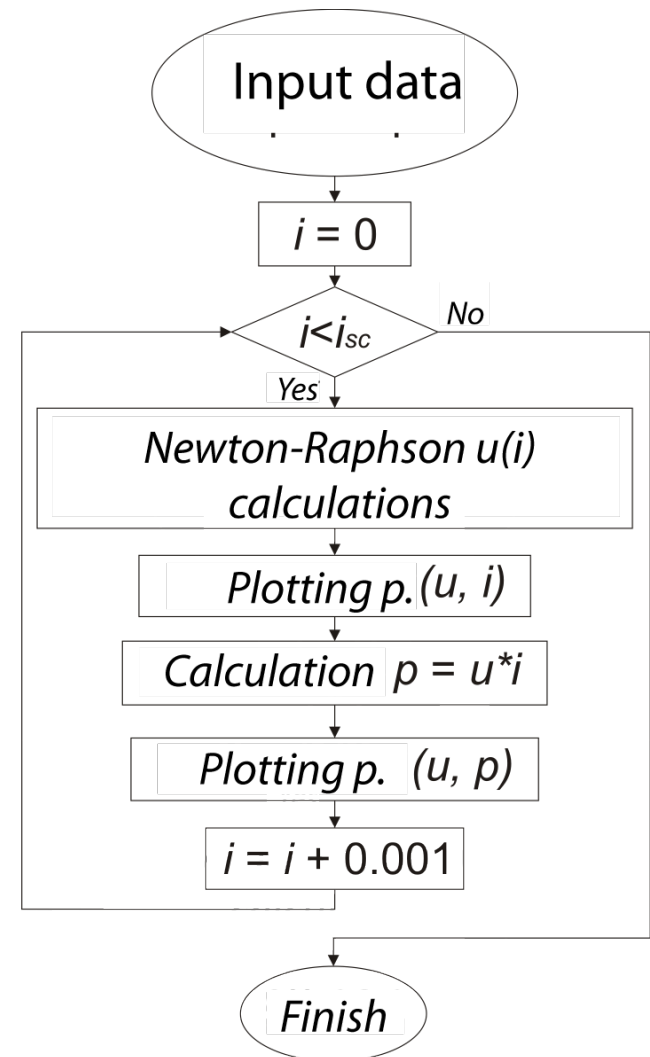
• Equivalent scheme of PV module



• Math model of PV module

$$\begin{cases} I = I_{sc} - I_0 \cdot \left(\exp\left(\frac{q \cdot V_d}{A \cdot k \cdot T}\right) - 1 \right) - \frac{V_d}{R_p}; \\ V = V_d - I \cdot R_s; \\ I_{sc} = \left(I_{sc}^{ref} + k_I \cdot (T - T_{ref}) \right) \cdot \frac{S}{1000}; \\ I_0 = I_0^{ref} \cdot \left(\frac{T}{T_{ref}} \right) \cdot \exp\left(\frac{q \cdot E_{Si}}{A \cdot k}\right) \cdot \left(\frac{1}{T_{ref}} - \frac{1}{T} \right) \end{cases}$$

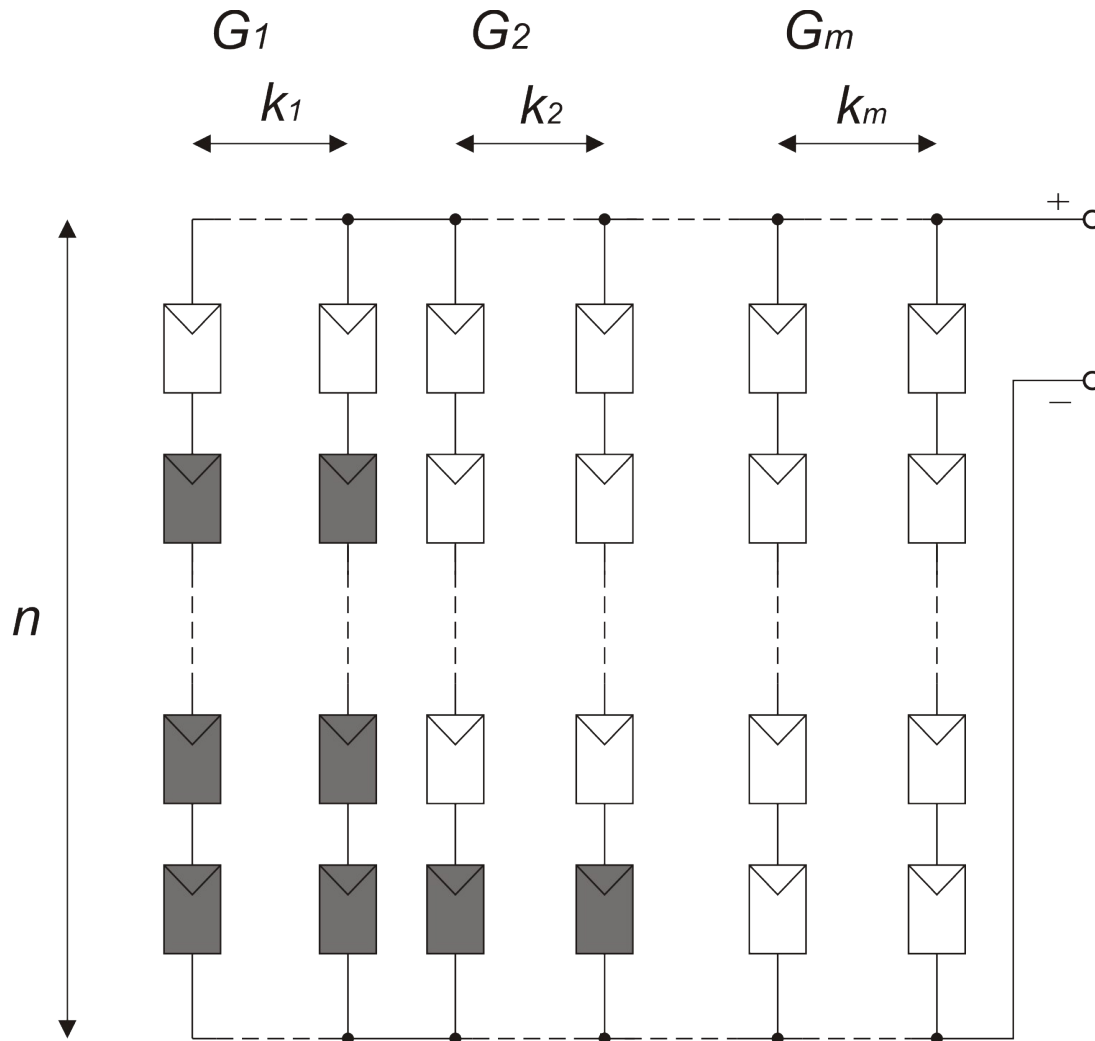
• Program algorithm



2. MPPT. Modelling

- PV Power Plant configuration model

- PV module parameters



PV Module Parameters

Input data for solar cell:

I_{sc} : T_{ref} :

4.7 25

I_0 : A :

$2 \cdot 10^{-5}$ 1.92

k_i : num cell:

$1.7 \cdot 10^{-3}$ 36

Solar Cell Material:

☒ Si

☐ GaAs

☐ CdTe

OK

2. MPPT. Simulation

- Application for calculating V-I and V-P characteristics in C++ Builder

