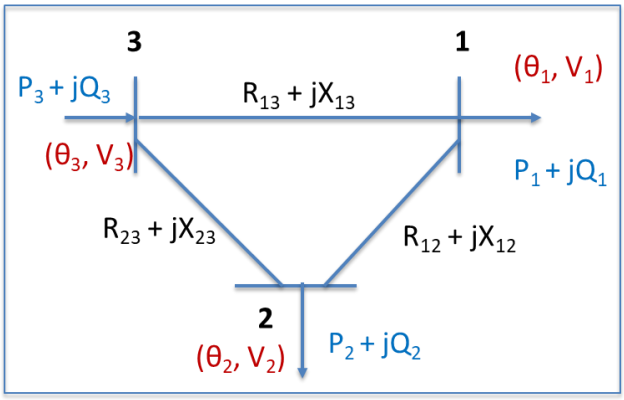
ELK14: Methods and Algorithms for Power Systems

Assignment 3: Decoupled Power Flow



Network	
R_{12}	0.1
X_{12}	0.2
R_{13}	0.05
X_{13}	0.2
R_{23}	0.05
X_{23}	0.15
Loads	
P_1	-1.0
Q_1	-0.5
P_2	-0.5
Q_2	-0.5

Figure 1: Example system – all data in PU.

The bus 3 can be used as slack bus (reference).

The calculations will be done on the example system shown in figure 1.

Show:

- Net injections and mismatch vector (right-hand side of equation) for each iteration
- The correction vector (angle and magnitude)
- Final solution

1. Calculate the base case conditions as specified in the table assuming a flat start (Angles equals zero and all bus voltages equals one) with the regular load flow
2. Solve the same case using:
    a. the primal Fast Decoupled Power Flow
    b. using the Dual Fast Decoupled Power Flow
    c. the standard Decoupled Power Flow
3. Define the $R_{ij} = X_{ij}$ for the transmission lines and check the performance of the Primal and Dual Fast Decoupled Power Flow with the original load profile
4. Increase the base load on bus 1 and compare the performance of the Primal and Dual Fast Decoupled Power Flow perform