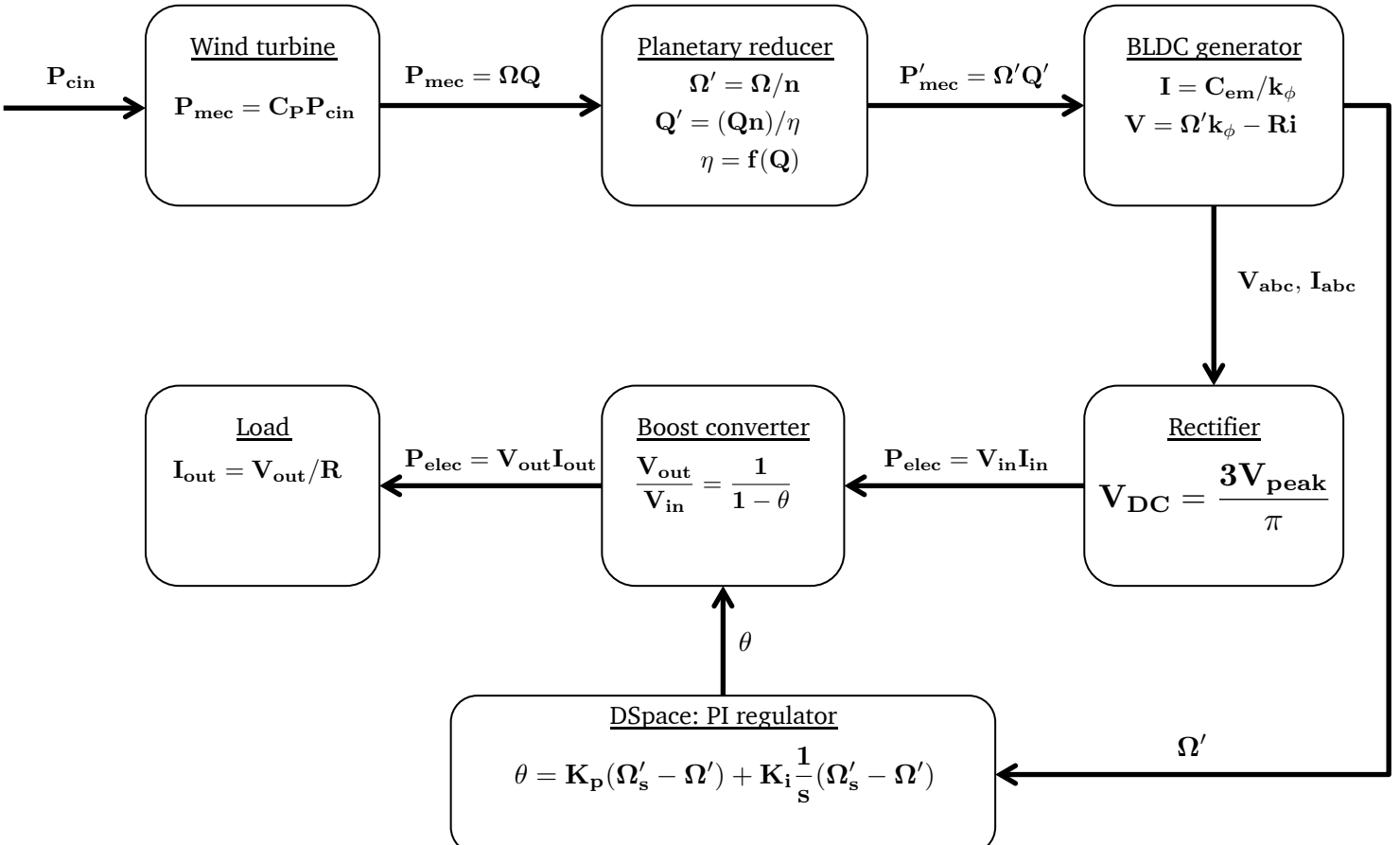
$\mathbf{P_{cin}}$
Wind turbine
$\mathbf{P_{mec} = C_P P_{cin}}$
$\mathbf{P_{mec} = \Omega Q}$
Planetary reducer
$\mathbf{\Omega' = \Omega / n}$
$\mathbf{Q' = (Qn)/\eta}$
$\eta = \mathbf{f(Q)}$
$\mathbf{P'_{mec} = \Omega' Q'}$
BLDC generator
$\mathbf{I = C_{em}/k_\phi}$
$\mathbf{V = \Omega' k_\phi - Ri}$
$\mathbf{V_{abc}}$, $\mathbf{I_{abc}}$
Rectifier
$\mathbf{V_{DC}} = \dfrac{\mathbf{3V_{peak}}}{\pi}$
$\mathbf{P_{elec} = V_{in} I_{in}}$
Boost converter
$\dfrac{\mathbf{V_{out}}}{\mathbf{V_{in}}} = \dfrac{\mathbf{1}}{\mathbf{1-\theta}}$
$\mathbf{P_{elec} = V_{out} I_{out}}$
Load
$\mathbf{I_{out} = V_{out}/R}$
θ
DSpace: PI regulator
$\theta = \mathbf{K_p}(\mathbf{\Omega'_s} - \mathbf{\Omega'}) + \mathbf{K_i}\dfrac{\mathbf{1}}{\mathbf{s}}(\mathbf{\Omega'_s} - \mathbf{\Omega'})$
$\mathbf{\Omega'}$