**MPC: Tracking output**

**System model**

**Modelling**

where: state, output, input

**Prediction**

**Predicted output**

where:

**Optimization**

where:

**Objective function**

where:

**Constraints**

**State constraints**

**Input constraints**

where:

**Input rate constraints**

where:

**Optimization problem (QP)**

where:

**MPC: Control Horizon**

**System Model**

**Prediction**

**Predicted state**

where:

**Optimization**

where:

**Objective function**

where:

**Constraints**

**State constraints**

**Input constraints**

where:

**Input rate constraints**

where:

**Optimization problem (QP)**

where:

**MPC: Terminal Cost and Set**

**System Model**

**Prediction**

**Predicted state**

where:

**Optimization**

where:

**Objective function**

where:

**Dual-mode prediction paradigm**

**Mode 1**

where:

**Mode 2**

Where P is the solution of the Lyapunov equation:

**Constraints**

**Terminal set**

The terminal constraint set it is used in order to guarantee that prediction over infinite time (mode 2) satisfies constraints on states and inputs, requiring they lie in a positively invariant set under the dynamics of mode 2:

which determines the following constraint:

where:

**Optimization problem (QP)**

**MPC: soft constraints**

**MPC: Explicit**

**MPC: Hybrid**

**MPC: LTV**

**MPC: Distribuited/decentralized**