

Chapter 4

Introduction

Left and/or right boundary conditions in the trajectories of states may be free, bounded or steady. In this article we will focus on related conditions in the trajectories of states, meaning that e.g. initial and/or final water levels in reservoirs have to satisfy binding equations, which are determined by the requirements set for the system of reservoirs. In order to illustrate this we will take simple equations of planes changing in time, in which points correspond to total water volume in all system reservoirs.

- Equation of plane for initial conditions $g_1(t_0^*)$, indicates optimal time to start reservoir system operation. Steady end time W

$$[d_1(t_0^*) \bullet d_m(t_0^*)] \cdot \begin{bmatrix} x_1(t_0^*) \\ \bullet \\ x_m(t_0^*) \end{bmatrix} - b_1(t_0^*) = 0 \tag{4.1}$$

- Equation of plane for final conditions $g_2(\widehat{W})$ in which \widehat{W} indicates optimal time to end reservoir system operation. Steady start time t_0

$$[e_1(\widehat{W}) \bullet e_m(\widehat{W})] \cdot \begin{bmatrix} x_1(\widehat{W}) \\ \bullet \\ x_m(\widehat{W}) \end{bmatrix} - b_2(\widehat{W}) = 0 \tag{4.2}$$

Optimisation time may be steady or free, with reference to both start and end optimisation time. As regards free optimisation start time, there are two further issues:

- Free Start Time (FST) t_0^* , at steady optimisation end time W .
- Free End Time (FET) \widehat{W} , at steady optimisation start time t_0 .