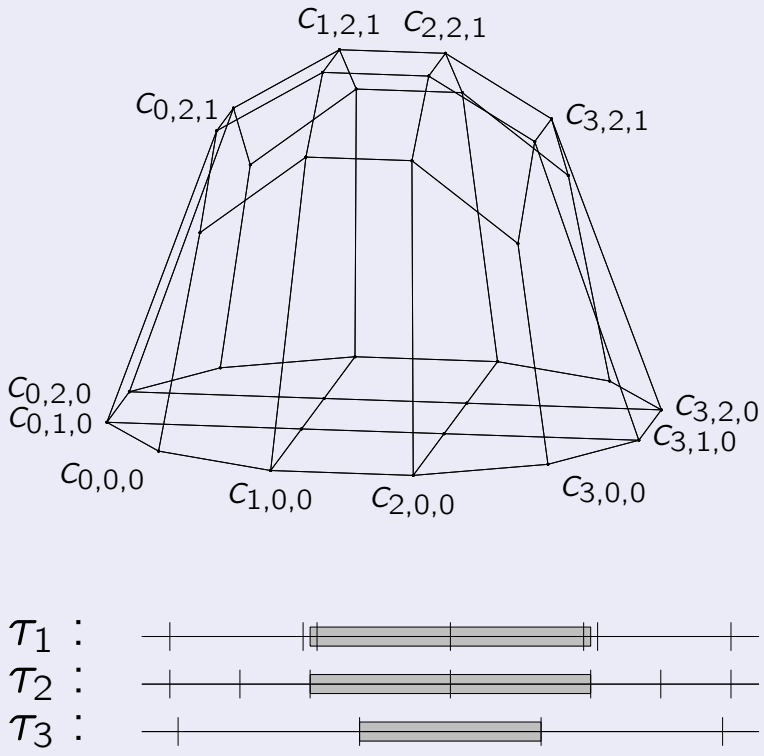
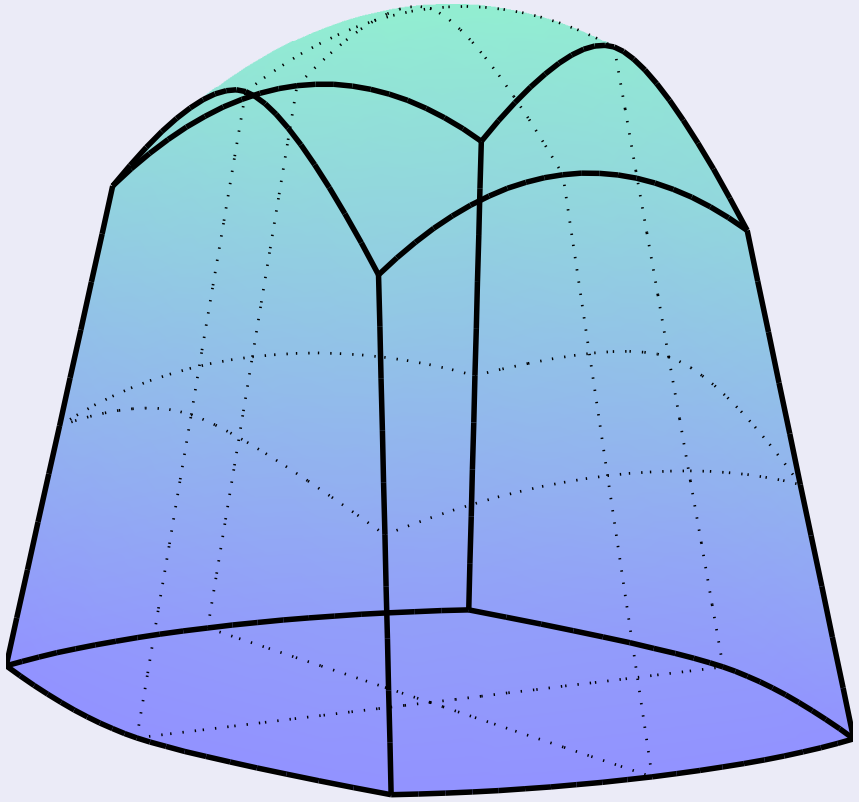
Spline Solids

A spline solid $S \subset \mathbb{R}^3$ is parametrized by trivariate splines:

$$(t_1, t_2, t_3) \mapsto p(t) = \sum_{k_1=0}^{m_1-1} \sum_{k_2=0}^{m_2-1} \sum_{k_3=0}^{m_3-1} c_k b^n_{k,\tau}(t)\,, \quad t \in D^n_\tau\,,$$

with control points $(c_{k,1}, c_{k,2}, c_{k,3})$ and
$D^n_\tau = [\tau_{1,n_1}, \tau_{1,m_1}] \times [\tau_{2,n_2}, \tau_{2,m_2}] \times [\tau_{3,n_3}, \tau_{3,m_3}]$.





The boundary of S consists of 6 spline surfaces, corresponding to the parameter values $t_\nu = \tau_{\nu,n_\nu}$, $t_\nu = \tau_{\nu,m_\nu}$ $(\nu = 1, 2, 3)$.