The digital implementation of (24) in the CDC2001 paper using (25) (Capacity predictor formula & impulse response of the FIR filter) leads to a FIR filter of the form:

$$F_{c_z} = a_0 + a_1 z^{-1} + \cdots + a_n z^{-n}. \tag{1}$$

Thus the predictor is implemented as

$$\begin{aligned} K_{c_z} &= \frac{2\tau}{\pi\alpha}\frac{1}{1+F_{c_z}} & (2)\\ &= \frac{2\tau}{\pi\alpha}F_{c1_z} & (3) \end{aligned}$$

where

$$F_{c1_z} = \frac{1}{(1+a_0) + a_1 z^{-1} + \cdots + a_n z^{-n}}. \tag{4}$$

According to the final value theorem the steady-state value of the output of K_{c_z} due to a unit step input is

$$\begin{aligned} \text{ss\_value} &= \lim_{z\to 1}(z-1)\frac{z}{z-1}K_{c_z} & (5)\\ &= \frac{2\tau}{\pi\alpha}\frac{1}{1+a_0+a_1+\cdots+a_n}. & (6) \end{aligned}$$

Due to the errors in the coefficients a_i's, ss_value is close, but not exactly equal, to 1. I checked that if the sampling time is taken smaller ss_value gets closer to 1. We can thus add a corrective term to K_{c_z} to compensate for this error by implementing K_c as $K_{c_{correction}} \cdot K_{c_z}$ with

$$\begin{aligned} K_{c_{correction}} &= \frac{1}{\text{ss\_value}} & (7)\\ &= \frac{\pi\alpha}{2\tau}(1+a_0+a_1+\cdots+a_n). & (8) \end{aligned}$$

This implementation should lead to much faster transients, even for small sampling time values.

Also Sthanu, note that the formula of K_2 is expressed differently compared to the previous version of the paper, and is easier to implement.