de Sitter Geometries

de Sitter space can be described as a submanifold embedded in a higher dimension Minskowski space. Working in $D = 4$, take the $D + 1$ Minkowski space defined as

$$ds^2 = -dx_0^2 + dx_1^2 + dx_2^2 + dx_3^2 + dx_4^2. \tag{1}$$

Now let us constrain our coordinates to a hyperboloid

$$-x_0^2 + x_1^2 + x_2^2 + x_3^2 + x_4^2 = C^2 \tag{2}$$