Actually, if each curve $(\sum_{\mathcal{L},\mathcal{R}})$ is contained in a (different) plane $P_{\mathcal{L},\mathcal{R}}$ we must have

$$\mathbf{n}_{\mathcal{L},\mathcal{R}} \cdot (\mathbf{X}_{\mathcal{L},\mathcal{R}}(\theta) - \mathbf{X}_{\mathcal{L},\mathcal{R}}(0)) = 0 \tag{19}$$

for every θ. This was indeed checked numerically up to a precision of 10^{-11}. It was also checked that $|\mathbf{X}_{\mathcal{L},\mathcal{R}}(\theta)| = 1$ up to the same precision. This proves that each curve $(\sum_{\mathcal{L},\mathcal{R}})$ must be a circle. The equations of the two planes $P_{\mathcal{L},\mathcal{R}}$ are given by $\mathbf{n}_{\mathcal{L},\mathcal{R}} \cdot (\mathbf{X} - \mathbf{X}_{\mathcal{L},\mathcal{R}}(0)) = 0$ where $\mathbf{X}$ is the Stokes vector associated with a running point belonging to each plane. We write

$$U_{\mathcal{L},\mathcal{R}} X_1 + V_{\mathcal{L},\mathcal{R}} X_2 + W_{\mathcal{L},\mathcal{R}} X_3 + D_{\mathcal{L},\mathcal{R}} = 0 \tag{20}$$

with $D_{\mathcal{L}} = -0.0237$ and $D_{\mathcal{R}} = -0.0266$. $|D_{\mathcal{L},R}|$ represents the distance separating the center of the circle $(\sum_{\mathcal{L},\mathcal{R}})$ to the origin of the poincaré sphere. This proves that the planes are not going through the center of the sphere. It was checked after lengthy calculations that if $|B| = |C|$ in the Jones matrix (see equation (1)) then $D = 0$. This shows that the property $|D_{\mathcal{L},R}| \neq 0$ is a characteristic of planar chirality (i.e, the condition $|B| \neq |C|$). The radius of each circle $(\sum_{\mathcal{L},\mathcal{R}})$ is given by $r_{\mathcal{L},\mathcal{R}} = \sqrt{(1 - D^2_{\mathcal{L},R})}$ and we have $r_{\mathcal{L}} = 0.9997$ and $r_{\mathcal{L}} = 0.9996$ which are slightly smaller than $r = 1$ in agreement with the fact that $P_{\mathcal{L},\mathcal{R}}$ are not going through the center of the sphere.

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