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SetDirectory["C:\\drorbn\\AcademicPensieve\\2015-09\\K34"]
C:\\drorbn\\AcademicPensieve\\2015-09\\K34

T =  $\pi (1 - \text{Cos}[t/2])$ ;
R =  $-\text{Cos}[t/2]$ ;
A = 3.5;
b = -2.6;
a = 1.95;

r =  $0.2 * 0.4 * (9 * R^4 + 1) * \sqrt{1 - R^2}$ ;
circ = {0, Sin[ $\theta$ ] * r, Cos[ $\theta$ ] * r};
dx =  $-0.5545454545 * \text{Sin}[T]^2 + 6.1 * (10 + \text{Cos}[T]) / 11 * \text{Cos}[T] + 1.3 * \text{Sin}[T/2]$ ;
dy =  $4.875 * \text{Cos}[1.95 * T + 0.05 * \pi]$ ;
n =  $\sqrt{dx^2 + dy^2}$ ;
dx = dx / n;
dy = dy / n;

rotMat =  $\begin{pmatrix} dx & -dy & 0 \\ dy & dx & 0 \\ 0 & 0 & 0.5 * (1 + 2 * (t / \pi - 1)^2) \end{pmatrix}$ ;

result = rotMat.circ;
coords = {
   $0.2 * ((A - b) * ((10.0 + \text{Cos}[T]) / 11.0) * \text{Sin}[T] + b * \text{Cos}[T/2]) + \text{result}[[1]]$ ,
   $0.5 * \text{Sin}[a * T - (a - 2) * \pi] + \text{result}[[2]]$ ,
  result[[3]],
  If[t <  $7/8 * \pi$ ,  $(1 - \text{Cos}[t * 8 / 7]) / 2$ ,  $0.7 * (\text{Cos}[8 * t - 7 * \pi]) + 0.3$ ]
};

ColorFunction -> Function[{x, y, z, t,  $\theta$ }, Hue[coords[[4]]]]

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MakeImage["Dalvit2KnotBroken",
  ParametricPlot3D[coords[[1 ;; 3]], {t, 0, 2 π}, {θ, 0, 2 π},
    RegionFunction → Function[{x, y, z, t, θ}, Not[
      z > 0.075 √{3.04 < t < 3.09} √{3.2 < t < 3.25} √{0.08² < 2 (t - 0.72)² + (θ - π/2)² <
        0.2²} √{0.08² < 2 ((2 π - t) - 0.72)² + (θ - 3 π/2)² < 0.2²}
    ]],
  Boxed → False, Axes → None,
  Mesh → None, PlotStyle → Opacity[0.7], PlotPoints → 400,
  ViewPoint → {1.80444, -2.11026, 1.93412},
  ViewVertical → {-0.0657752, 0.0609542, 5.23912}
], ImageSize → 720]

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