

Catalan's minimal surface

1 Abstract

Catalan's minimal surface is a minimal surface originally studied by Eugène Charles Catalan in 1855. It has the special property of being the minimal surface that contains a cycloid as a geodesic. It is also swept out by a family of parabolae. (from Wikipedia)

2 Definition

It can be represented parametrically as

$$\begin{aligned}x(u, v) &= u - \sin u \cosh v \\y(u, v) &= 1 - \cos u \cosh v \\z(u, v) &= 4 \sin \frac{u}{2} \sinh \frac{v}{2}\end{aligned}$$

for u, v in \mathbb{R} .

References

- [1] MathWorld by Wolfram, <http://mathworld.wolfram.com/CatalansSurface.html>