

A Conjugate Paramerization

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```
> restart: with(plots): with(LinearAlgebra):  
> F := 1/(cos(u) + cos(v) - 2) * Vector([sin(u) - sin(v), sin(u)+  
sin(v), cos(v)-cos(u)]);
```

$$F := \begin{bmatrix} \frac{\sin(u) - \sin(v)}{\cos(u) + \cos(v) - 2} \\ \frac{\sin(u) + \sin(v)}{\cos(u) + \cos(v) - 2} \\ \frac{\cos(v) - \cos(u)}{\cos(u) + \cos(v) - 2} \end{bmatrix} \quad (1)$$

```
> Fu :=map(diff, F, u):  
> Fv := map(diff, F, v):  
Fuv := map(diff, Fu, v):  
> Rank(Matrix([Fu, Fv, Fuv]));
```

2

(2)

```
> k0 := Pi/4: k1 := 2*Pi-Pi/4:  
> plot3d([F[1], F[2], F[3]], u=-Pi..Pi, v=k0..k1, scaling=  
constrained);
```

