Figure 1

Schematic reproduction
of SDCM Swallowtail in a
3/4 resonance region.
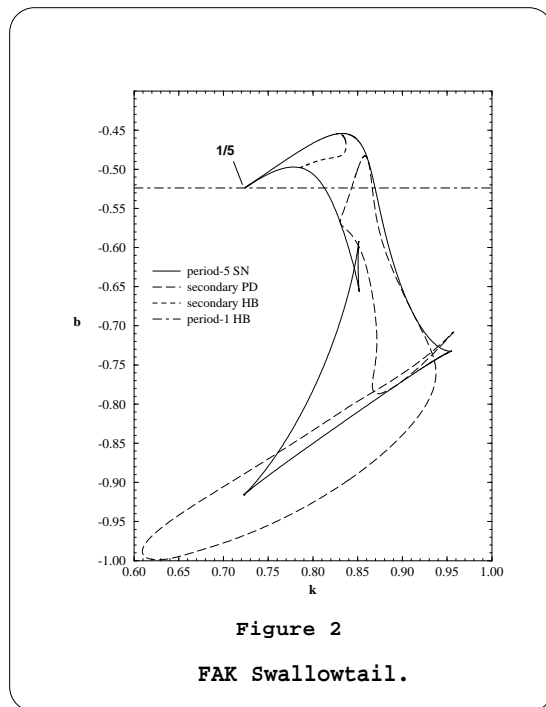

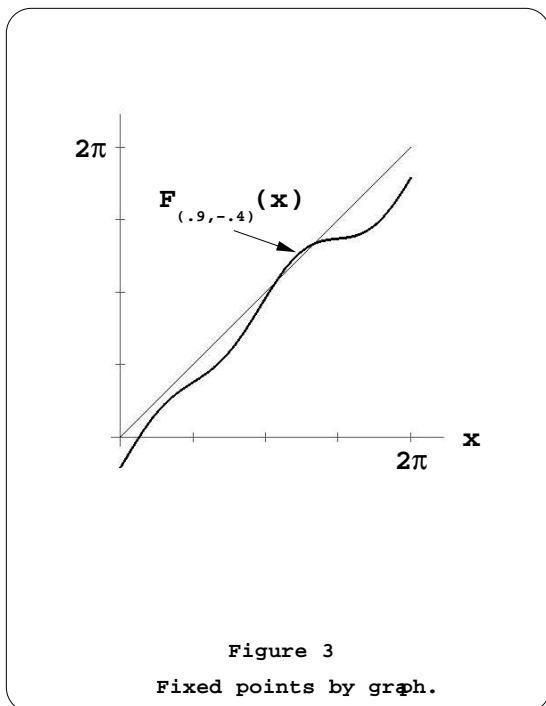**Figure 2**

FAK Swallowtail.

Figure 3

Fixed points by graph.
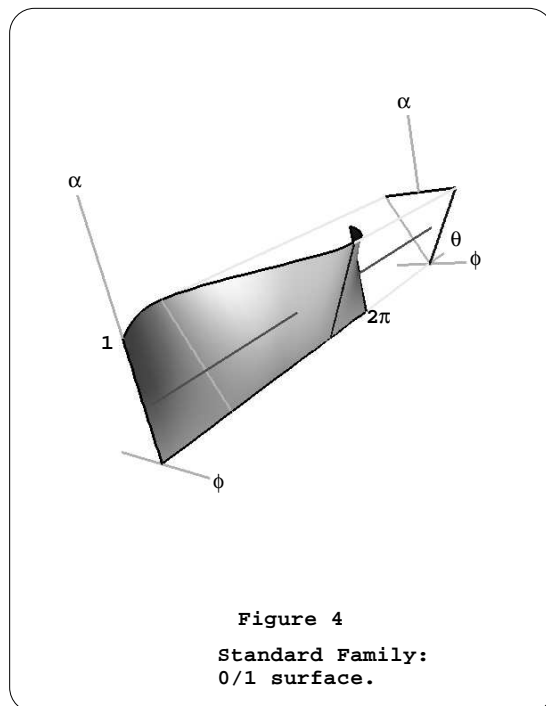

Figure 4

Standard Family:
0/1 surface.
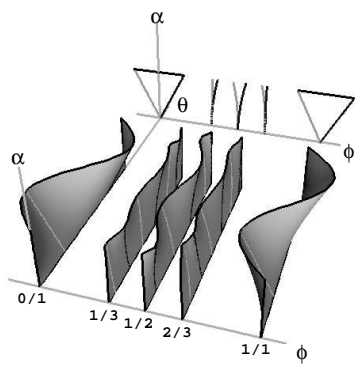
Figure 5
Standard Family:
several surfaces.

α

θ

φ

α

0/1   1/3 1/2 2/3   1/1   φ

α

α

θ
φ

1

2π

φ
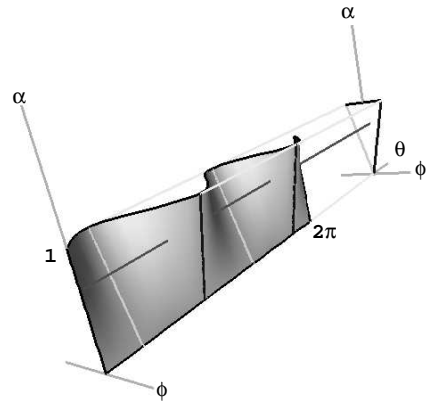
Figure 6

Coincident Projections.

α

α

θ
φ

1

2π

φ
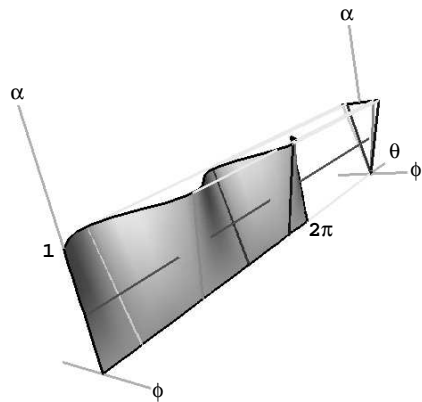
Figure 7
Noncoincident
Projections.

H(x)   h(x)

1

1   x
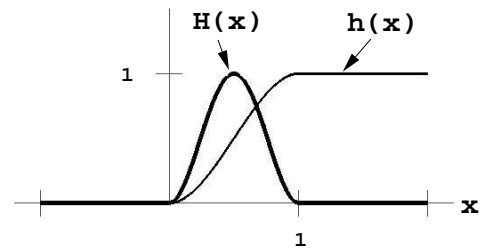
Figure 8

Bump functions.

$g_\alpha(x)$

α=0.9

α=0.5

α=0.1

1

x

2π
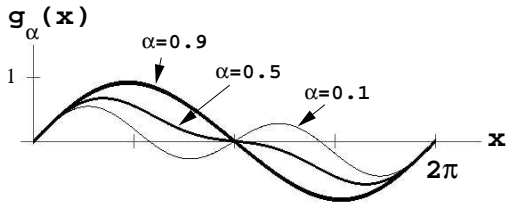
Figure 9a

Single flame.

α

α

θ

ϕ

1

2π

ϕ
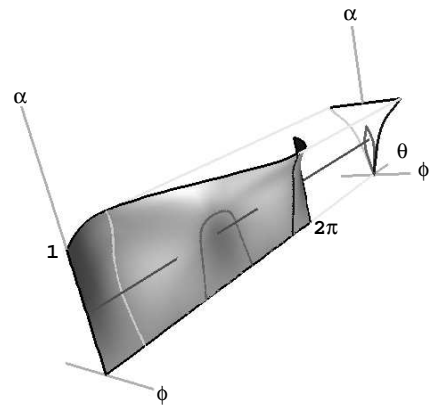
Figure 9b

Single Flame.

α

α

θ

ϕ

1

2π

ϕ
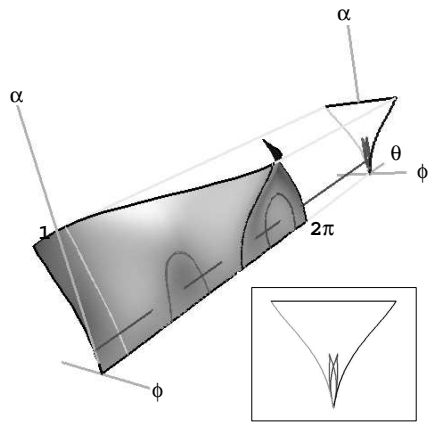
Figure 10

Double Flame.

α

α

θ

ϕ

1

2π

ϕ
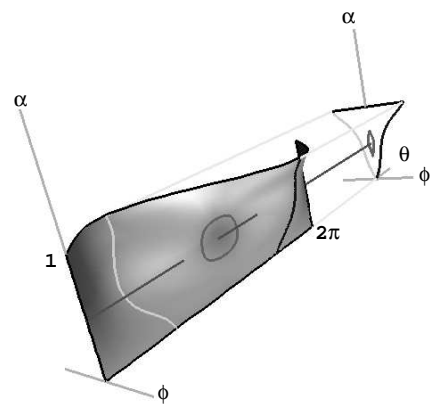
Figure 11

Center Fold.
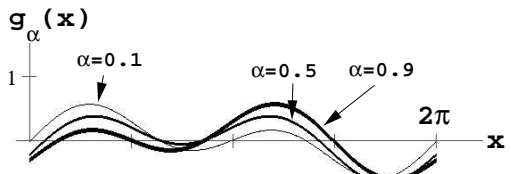
Figure 12a
Left-side crossing.
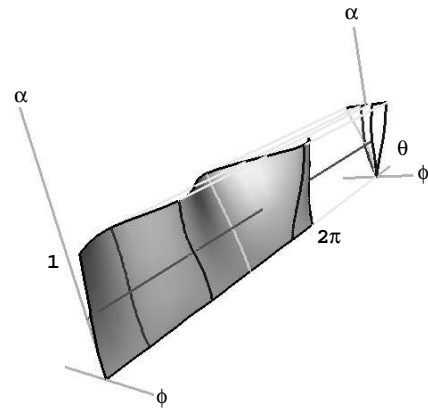

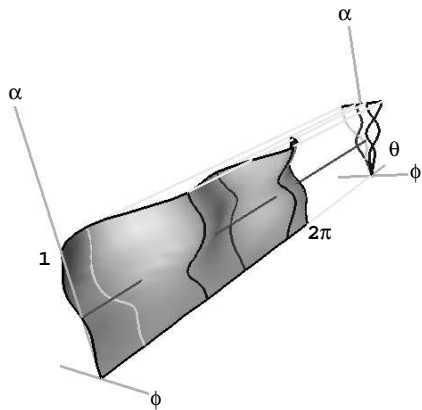**Figure 12b**
Left-side crossing.
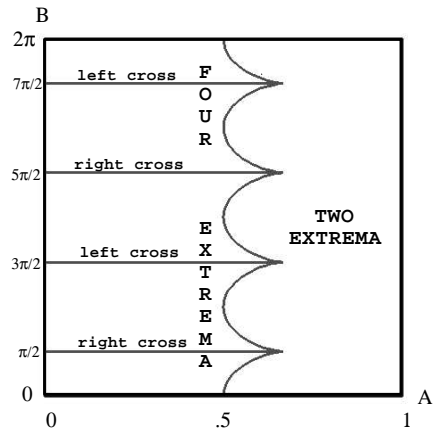

Figure 13
Full Twist.

Figure 14a
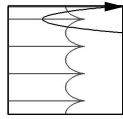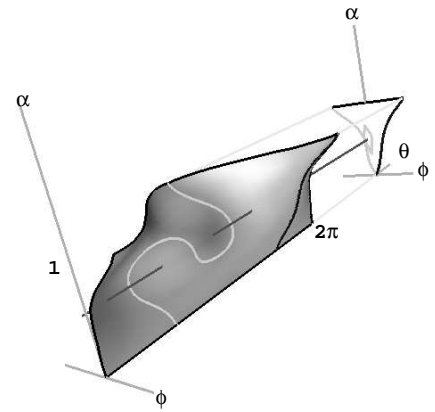**The two mode parameter space.**
((1−A)/2) sin(2x) + A sin(x + B)

Figure 14b

The Swallowtail path.

Figure 15

Left-edge Swallowtail.