Utils

3d Draghilev method

4D hypersurface

$$w(x, y, z) := \cos(2\cdot\pi\cdot(x+y-2\cdot z)) + \cos(2\cdot\pi\cdot(y+z-2\cdot x)) + \cos(2\cdot\pi\cdot(z+x-2\cdot y))$$

Domain

$$D(x, y, z) := (0<x<1)\cdot(x<y<1)\cdot(y<z<1)$$

Functions for Dragilev method

$$f(x) := \begin{bmatrix} w(x_1, x_2, x_3) \\ x_3 - zg_{nz} \end{bmatrix} \qquad D(v) := D(v_1, v_2, v_3)$$

$$ApplyD(M) := \left| \begin{array}{l} A := \mathrm{matrix}(0, 3) \\ \mathrm{for}\ \ k \in [1..\mathrm{rows}(M)] \\ \quad A := \mathrm{stack}(A, \mathrm{row}(M, k)\cdot D(\mathrm{row}(M, k))) \\ A \end{array} \right.$$

2D grid

$$N := 20 \qquad xg := pRange(0, 1, N) \qquad yg := pRange(0, 1, N)$$

$$nx := [1..N] \qquad ny := [1..N]$$

Level surfaces (like level courves)

$$nz := [1..6] \qquad zg := pRange(0.5, 0.9, \mathrm{length}(nz))$$

$$Sols(zo) := \left| \begin{array}{l} F(x, y) := \left| \begin{array}{l} \mathrm{if}\ \ D(x, y, zo) \\ \quad \left| \begin{array}{l} f(z) := w(x, y, z) \\ zk := S_{NR}("f", zo) \\ \mathrm{stack}(x, y, zk\cdot D(x, y, zk)) \end{array} \right. \\ \mathrm{else} \\ \quad \mathrm{stack}(x, y, 0) \end{array} \right. \\ pMesh("F", xg, yg) \end{array} \right.$$

$$S_{nz} := Sols(zg_{nz}) \qquad \gamma := pView2(145\ °, 48\ °)$$

Choose an x,y pair

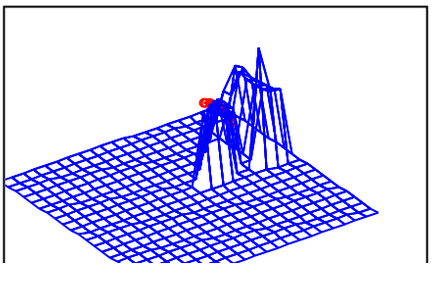
$$a := 0.4 \qquad b := 0.7 \qquad [\Delta t := 0.01 \quad tmax := 1.4]$$

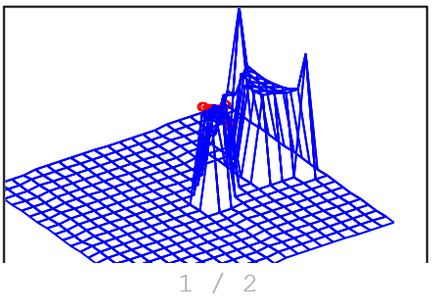
Fridel Dragilev 3D

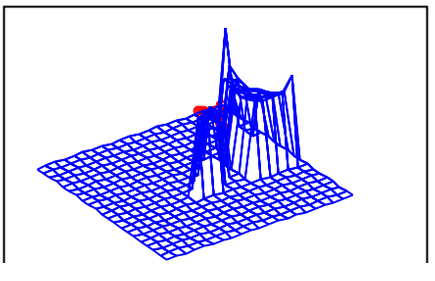
$$x0_{nz} := \mathrm{stack}(a, b, zg_{nz}) \qquad B_{nz} := DM_3(x0_{nz}, tmax, \Delta t)$$

$$B_{nz} := ApplyD(B_{nz})$$

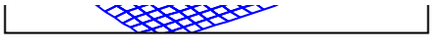
$$Plot(n) := \begin{cases} S_n\cdot\gamma \\ B_n\cdot\gamma \\ \mathrm{augment}(B_n\cdot\gamma, "o", 8, "red") \end{cases}$$





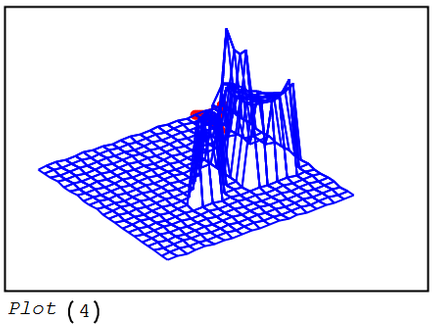


*Plot* (1)

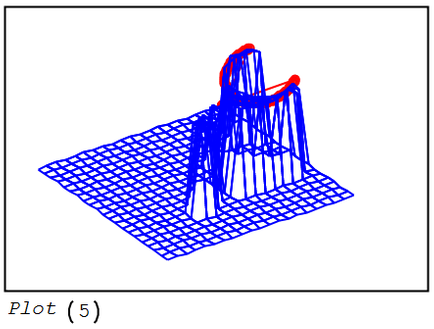


*Plot* (2)

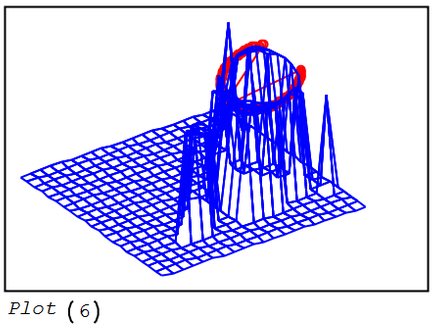
*Plot* (3)



*Plot* (4)



*Plot* (5)



*Plot* (6)

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*Alvaro*