Contour Plots of implicit functions in XYPlot

pClr

Example

Function

$$z := 3\cdot\frac{(1-x)^2}{e^{x^2+(y+1)^2}} - 10\cdot\frac{\frac{x}{5}-x^3-y^5}{e^{x^2+y^2}} - \frac{1}{3\cdot e^{(x+1)^2+y^2}}$$

Ranges $\begin{bmatrix} x1 & x2 \\ y1 & y2 \end{bmatrix} := \begin{bmatrix} -3 & 3 \\ -3 & 3 \end{bmatrix}$ Box in the description of the XYPlot

$Z := [-5, -4.5..5]$ $n := \text{length}(Z)$

Colormap $cm := pCMap("Jet", n, 1)$

$\alpha := 0.25$ Transparency for filling

Plot $XYPlot'Points := 50$ $\Lambda := \{1$

$t\# := "XYPlot'Traces\#"$ $cm' := cm + 16^6\cdot(1+\text{trunc}(255\cdot\alpha))$

$t(s, k, v) :=$

$:= \text{concat}(t\#, \text{num2str}(k-1), "'", s, ":"", \text{num2str}(v), """)$

for $k \in [1..n]$

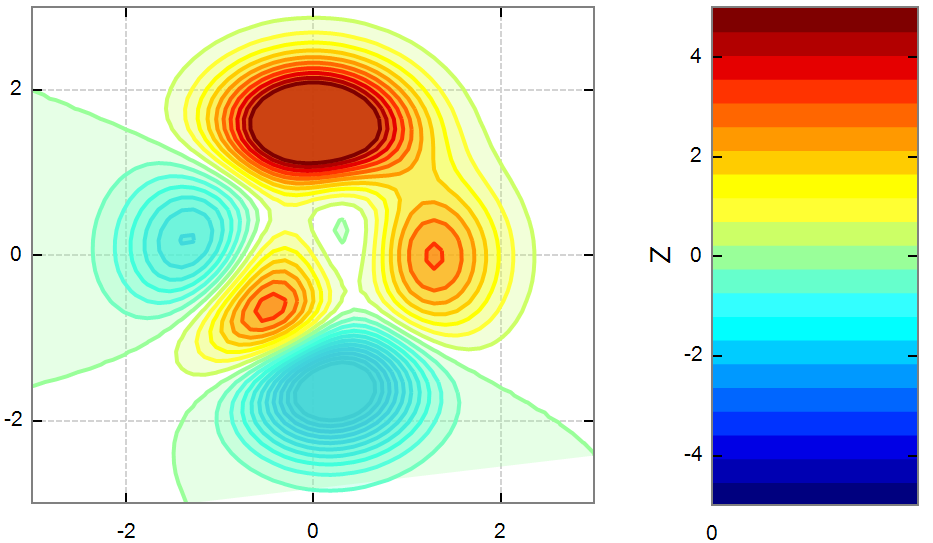
$\Lambda_k := z - Z_k$

$\text{str2num}(t("FillStyle'Filled", k, "True"))$

$\text{str2num}(t("FillStyle'FillColor", k, cm'_k))$

$\text{str2num}(t("LineStyle'Thickness", k, "2"))$

$\text{str2num}(t("LineStyle'LineColor", k, cm_k))$



Example

Log-spaced level curve

$z := \left(x^2 + y - 11\right)^2 + \left(x + y^2 - 7\right)^2$ Himmelblau's function

$Zo := [-3, -2.75 .. 2]$ $\begin{bmatrix} x1 & x2 \\ y1 & y2 \end{bmatrix} := \begin{bmatrix} -5 & 5 \\ -5 & 5 \end{bmatrix}$ $Z := 10^{\overrightarrow{Zo}}$

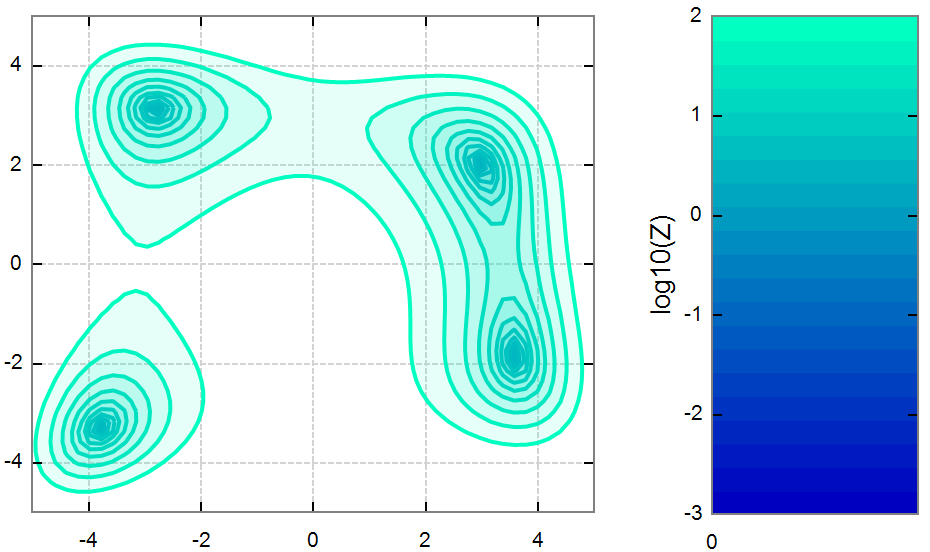
$n := \text{length}(Z)$

$cm := pCMap([-1\ 0\ 192], n, 1)$ $\alpha := 0.1$

Plot $XYPlot'Points := 50$ $\Lambda := \{1$

$cm' := cm + 16^6 \cdot (1 + \text{trunc}(255 \cdot \alpha))$

```
for k ∈ [1..n]
    Λ_k := z − Z_k
    str2num(t("FillStyle'Filled", k, "True"))
    str2num(t("FillStyle'FillColor", k, cm'_k))
    str2num(t("LineStyle'Thickness", k, "2"))
    str2num(t("LineStyle'LineColor", k, cm_k))
```



Alvaro

appVersion(4) = "1.73.9126.0"