

L11 B Feb 9, 2021

what if $\Theta \wedge d\Theta \neq 0$?

Max rank : $\exists k$ s.t.

$$(d\Theta^k \wedge \Theta)(p_0) \neq 0$$

$$(d\Theta^{k+1} \wedge \Theta)(p_0) = 0$$

"rank of Θ "

If l is loc. const then
[\exists coord

$$z, x^i, y^i, u^a$$

$i=1, \dots, l$

s.t.

$$\Theta = dz - \sum y^i dx^i$$

a version of Darboux.

cf. EDS, Thm 1.5, 1.7
& chapter 1
&

Theorem 3.1, p 34

Pfaff early 1800's

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2.

important in my work.

$$\theta = dz - y^2 dx.$$

$$\theta \wedge d\theta \neq 0 \quad \text{any form } y \neq 0$$

$$\theta \wedge d\theta = 0 \quad \text{on } y = 0.$$

Singularity theory,

Martinet:

$$\text{say } \theta \wedge d\theta = f d^3 x.$$

$$f(0) = 0$$

$$(df \wedge \theta)(0) \neq 0.$$

Then \exists coord x, y, z

$$\text{s.t. } \theta =$$

if θ ranks jump.

singularity theory comes in.

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3.

On to Lie groups!

Eg

Def A Lie group G is a

1) group

2) smooth manifold.

s.t.

$$G \times G \xrightarrow{\text{mult}} G$$
$$g, h \longmapsto gh$$

$$\& \quad G \xrightarrow{\text{invers}} G$$

are smooth maps.

Egs . . . ? anyone?

(see HW 6)