

How can you tell if two metrics describe the same manifold?

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Hi-

Is there an algorithm that would allow one to tell if two different metrics describe the same manifold? Of course you can always find a change of coordinates that transfers the first metric into the second, but I wouldn't call that an algorithm, rather it is a more of a hit and miss thing. Some very seemingly different metrics like

$$ds^2 = dx^2 - dt^2$$

and

$$ds^2 = du^2 - u^2 dv^2$$

both really describe the same manifold (flat Minkowskian). In this case a simple transformation of coordinates can derive the second metric from the first, but in general it is difficult to do this. Any ideas?

thanks

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