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## Kähler potential

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A Kähler potential is a real-valued function  $f$  defined on some coordinate patch of a Hermitean manifold such that the metric of the manifold is given by the expression

$$g_{ij*} = \frac{\partial^2 f}{dz^i d\bar{z}^j}.$$

It turns out that, for every Kähler manifold, there will exist a coordinate neighborhood of any given point in which the metric can be expressed in terms of a potential this way.

As an elementary example of a Kähler potential, we may consider  $f(z, \bar{z}) = z\bar{z}$ . This potential gives rise to the flat metric  $ds^2 = dzd\bar{z}$ .

Kähler potentials have applications in physics. For example, this function  $f(x) = \log(x) + g(x)$  relates to the motion of certain subatomic particles called gauginos.

## References

- [1] T. Barreiro, B. de Carlos & E. J. Copeland, “On non-perturbative corrections to the Kähler potential” *Physical Review D* 57 (1998): 7354 - 7360