1018-51-26 **Steffen Winter*** (winter@minet.uni-jena.de), Mathematisches Institut, Universität Jena, 07737 Jena, Germany. *Curvature measures and fractals.*

For compact sets $F \subseteq \mathbb{R}^d$ (e.g. fractals), for which classical geometric characteristics such as curvatures or Euler characteristic are not available, we follow the approach to study these notions for their ϵ-parallel sets

$$F_\epsilon = \{x : \mathrm{dist}(x, F) \leq \epsilon\}$$

instead, expecting that their limiting behaviour as $\epsilon \to 0$ does provide information about the structure of the initial set F. In particular, we investigate the limiting behaviour of the total curvatures (or intrinsic volumes) $C_k(F_\epsilon); k = 0, \ldots, d$ as well as weak limits of the corresponding curvature measures $C_k(F_\epsilon, \cdot)$ as $\epsilon \to 0$. This leads to the notions of *fractal curvature* and *fractal curvature measure*, respectively.

For certain classes of self-similar sets, we present results on the existence of (averaged) fractal curvatures. These limits can be calculated explicitly and are in a certain sense 'invariants' of the sets, which may help to distinguish and classify fractals. Based on these results we will also characterize the fractal curvature measures of these sets. (Received February 02, 2006)