

# **Minimal symmetry breaking of the cosmological principle**

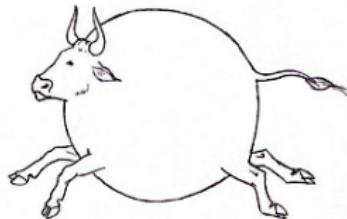
Galliano Valent, André Tilquin, Thomas Schücker

# Our Planet

The paradigm of the **spherical cow** is useful:

**'geographic' deviations:** Mount Everest

$$8.8 \text{ km} \cdot 2\pi / (40\,000 \text{ km}) \approx 1.4 \cdot 10^{-3}.$$

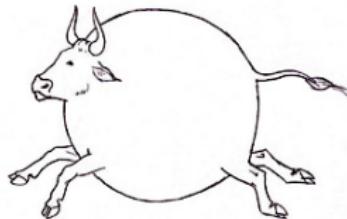


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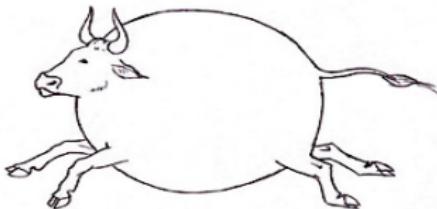
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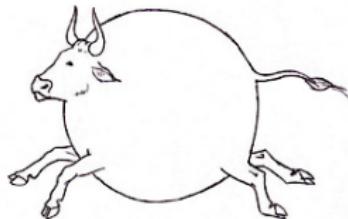


**'geometric' deviations:** (equatorial – polar) radius = 21.3 km,

$$21.3 \text{ km} \cdot 2\pi / (40 \text{ 000 km}) \approx 3.3 \cdot 10^{-3}.$$

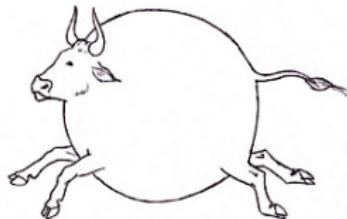


# Our Universe

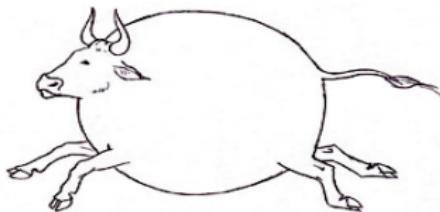


Robertson-Walker + CMB ( $\approx 10^{-5}$ ) + CDM + ...

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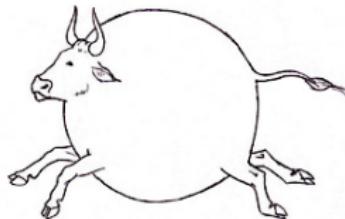


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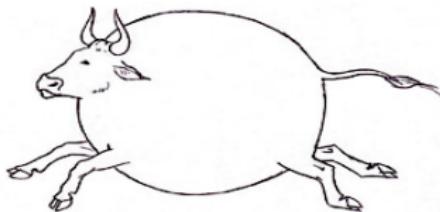


axial Bianchi I, V, IX + CMB + CDM + ...

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axial Bianchi I, V, IX + CMB + CDM + ...



Bianchi II, III, IV, VI<sub>h</sub>, VIII + CMB + CDM + ...