

# ON THE INITIAL SINGULARITY IN KANTOWSKI-SACHS SPACETIME

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**Emergent Universe**



**The Universe originates from a non-singular static stat.**

**Motivation**



**Can a non-FLRW static state be a seed for an emergent universe?**

**Spacetime**



**Kantowski-Sachs**

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**01**

**General Relativity**

**02**

**5D braneworld scenario**

**03**

**5D model without brane**

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# Fluid

01

**Generic linear EoS**

02

**Chaplygin gas**

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# Results

Theory \ Fluid	Perfect fluid	Anisotropic fluid		
	$p_r = p_t = \omega\rho$	$p_r = \omega_r\rho$ $p_t = \omega_t\rho$	$p_r = \omega\rho + p_{0r}$ $p_t = \omega\rho + p_{0t}$	$p_r = -\frac{\alpha_r}{\rho^n}, p_t = -\frac{\alpha_t}{\rho^m}$
4D GR	✗	✗	✓	✗
5D <i>without</i> brane	✗	✗	✓	✗
5D braneworld	✗	✓	✓	✓

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More details: <https://link.springer.com/article/10.1140/epjc/s10052-021-09355-7>

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