Open problems on the geometry (at infinity) of GRS and singularity models

- Must any singularity model have bounded $|Rm|$? Weaker questions would be for $|Rc|$ or $R$. By Grisha Perelman’s work, this is true in dimension 3.

- Must any gradient Ricci soliton have bounded $|Rm|$? There are works of Ovidiu Munteanu and Natasa Sesum and Ovidiu Munteanu and Mu-Tao Wang.

- One can combine the two assumptions above.

- Under either or both of the two assumptions above, does the asymptotic cone exist? Is it unique? Is it regular? There is work by Jeff Cheeger, Toby Colding, and Gang Tian on Ricci flat manifolds.

- Must a shrinker which does not split have positive AVR? There is work of Fuquan Fang, Xiang-Dong Li, and Zhenlei Zhang and Ovidiu Munteanu and Jiaping Wang on sufficient conditions for splitting.

- Are there examples of nonsplitting shrinkers whose curvatures are not quadratically decaying? The examples of Misha Feldman, Tom Ilmanen, and Dan Knopf have quadratic curvature decay.