**A density function for the Ricci flow**

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Abstract:

Inspired by the density function for mean curvature flow introduced by Stone and based on Huisken's monotonicity formula, we define a similar quantity for the Ricci flow, related to the monotonicity of Perelman's W-functional. We discuss its connections with the singularities in the "Type-I case" and we give an alternative proof of the result of Enders, Mueller and Topping that around a type-one singular point, blowing-up the flow in a suitable way, one obtains a shrinking gradient Ricci soliton in the geometric limit (in every dimension). In perspective, this line of analysis could work also for general singular points (type-II) in dimension two and three (and very hopefully four). This would give another and more natural method to get an asymptotic shrinking gradient Ricci soliton, alternative to Perelman's blow-up/blow-down procedure.