Grisha Perelman's legacy or a failed proof of Poincare Conjecture

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Abstract

On December 22, 2006, the journal Science honored Perelman's proof of the Poincaré conjecture as the scientific "Breakthrough of the Year", the first time this honor was bestowed in the area of mathematics. But the "caps" and "cylinders" are not present in initial manifold and the original manifold has lost "strands": "surgery" is surgery!

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Quote from 2019 Wikipedia "Poincaré conjecture"

Perelman proved [1] the conjecture by deforming the manifold M using the Ricci flow (which behaves similarly to the heat equation that describes the diffusion of heat through an object). The Ricci flow usually deforms the manifold towards a rounder shape, except for some cases where it stretches the manifold apart from itself towards what are known as singularities. Perelman and Hamilton then chop the manifold at the singularities (a process called "surgery") causing the separate pieces to form into ball-like shapes.

Hamilton created a list of possible singularities that could form but he was concerned that some singularities might lead to difficulties. He wanted to cut the manifold at the singularities and paste in caps (NB! PROBLEM A), and then run the Ricci flow again, so he needed to understand the singularities and show that certain kinds of singularities do not occur.

In essence Perelman showed that all the strands that form can be cut and capped (NB! PROBLEM A) and none stick out on one side only.

Completing the proof, Perelman takes any compact, simply connected, three-dimensional manifold without boundary and starts to run the Ricci flow. This deforms the manifold into round pieces with strands (NB! PROBLEM B) running between them. He cuts the strands and continues deforming the manifold until eventually he is left with a collection of round three-dimensional spheres. Then he rebuilds the original manifold by connecting the spheres together with three-dimensional cylinders (NB! PROBLEM C), morphs them into a round shape and sees that, despite all the initial confusion, the manifold was in fact homeomorphic to a sphere S.

Problems I have noticed

PROBLEM A: the caps, which do not belong to the original manifold M, are going into the final sphere S.

PROBLEM B: the strands, which belong to the original manifold M, are not going into the final sphere S.

PROBLEM C: the cylinders, which do not belong to the original manifold M, are going into the final sphere S.

The caps and cylinders are not present in initial manifold M and the original manifold M has lost strands.

Thus, there is no identical deformation

$$initial\ manifold \neq final\ sphere$$

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[1] Dana Mackenzie, “The Poincaré Conjecture–Proved”. Science 314 (5807): 1848–1849 (2006)