Top quark mass measurements: how precise does it get?

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The mass of the top quark is a fundamental parameter of the standard model and has to be determined experimentally. Its precise knowledge can be used to constrain new physics models or to check the internal consistency of the standard model. Dramatic improvements in experimental techniques allowed to achieve an unprecedented uncertainty of below 0.5%. In this talk, I review recent measurements of the top quark mass, present the first world combination, and outline the perspectives for future improvements.