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Supersonic Electroweak Baryogenesis: Baryon Asymmetry from Fast Bubble Walls

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It is widely assumed that for the Electroweak Baryogenesis mechanism to be effective in generating the baryon asymmetry of the Universe, the first order phase transition bubbles have to expand at a subsonic speed (in order to allow for the diffusion of CP asymmetric currents in front of the wall). Here we present a new mechanism for Electroweak Baryogenesis that is effective for supersonic bubble walls, and relies on the formation of small bubbles of symmetric phase in the plasma behind the bubble wall (which is in the broken phase) due to the heating of the plasma as the wall passes by.

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