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**Abhijnan Rej\*** ([rej@mpim-bonn.mpg.de](mailto:rej@mpim-bonn.mpg.de)), Vivatsgasse 7, 53111 Bonn, Germany. *Hypersurfaces from Feynman graphs*. Preliminary report.

Given a Feynman graph, one obtains a singular hypersurface in a projective space of dimension equal to the number of edges of the graph by setting the Kirchhoff polynomial of that graph to zero. These hypersurfaces have a very rich geometry and recently Bloch-Esnault-Kreimer have shown that for a certain class of Feynman graphs, pieces of the cohomology of the associated hypersurfaces are mixed Tate motives. This leads to a surprising connection between arithmetic algebraic geometry and quantum field theory. In the first part of my talk, I will survey the general properties of graph hypersurfaces and the emerging motivic theory of Feynman graphs and integrals. In the second part of my talk, I will describe my work with C. Bergbauer on the geometry and topology of hypersurfaces of Feynman graphs that are obtained by inserting one Feynman graph into another. I will mostly focus on primitive Feynman graphs, though it is expected that the methods that we use will extend to more general graphs as well. (Received August 05, 2007)