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Polyhedral Superconducting Cavities for Linac Colliders NATHANIEL POGUE, PETER MCINTYRE, DIOR SATTAROV, Texas A&M University — The next priority for research facilities in high-energy physics is an electron-positron linac collider. The technological heart of the project is a ~ 20 km string of superconducting cavities that must accelerate the two beams to a collision energy of about 1 TeV. The success of the project will depend upon efforts to push the performance and reduce the cost for manufacturing the cavities. A novel approach to cavity design is being developed at Texas A&M, in which the cavities are constructed as a polyhedron. The critical inner surface is accessible through the whole fabrication process. This approach has several interesting benefits: it makes it possible to kill deflecting modes that could limit luminosity, it makes possible a simpler means to refrigerate the cavities, and eliminates the 'breathing' of cavities from the Lorentz pressure when they are energized. The open geometry allows for the use of advanced superconducting materials to push performance. The cavity design will be presented, and work to develop and test models will be described.

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