Properties of MgB\textsubscript{2} Thin Films Grown at Different Temperatures by Hybrid Physical-Chemical Vapor Deposition\textsuperscript{1} MENNO VELDHORST\textsuperscript{2}, KE CHEN, Department of Physics, The Pennsylvania State University, University Park, Pennsylvania, USA, CHE-HUI LEE, Department of Materials Science and Engineering, The Pennsylvania State University, University Park, Pennsylvania, USA, QI LI, XIAOXING XI\textsuperscript{3}, Department of Physics, The Pennsylvania State University, University Park, Pennsylvania, USA — MgB\textsubscript{2} films grown by Hybrid Physical-Chemical Vapor Deposition (HPCVD) at high temperature excel in $T_c$, cleanness, and crystallinity. MgB\textsubscript{2} films have been grown at temperatures from 350$^\circ$C to 750$^\circ$C by a HPCVD system with separate Mg and substrate heaters. The 100 nm MgB\textsubscript{2} film grown on a (001) SiC substrate at 350$^\circ$C has a $T_{c0}$ of about 36K and a residual resistance ratio of about 1.4. X-ray diffraction and atomic force microscopy show that the film is polycrystalline. The low-temperature grown MgB\textsubscript{2} films are promising as the top electrode for sandwich-type all-MgB\textsubscript{2} junctions to preserve the integrity of the barrier layer.

\textsuperscript{1}This work is supported by ONR.
\textsuperscript{2}Also with The Faculty of Science and Technology and MESA+ Institute for Nanotechnology, University of Twente, Enschede, The Netherlands
\textsuperscript{3}Also with Department of Materials Science and Engineering, The Pennsylvania State University, University Park, Pennsylvania, USA