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**Transition to turbulence in pulsating pipe flow** BJORN HOF, Institute of Science and Technology Austria, SASCHA WARNECKE, DUO XU, Max Planck Institute for Dynamics and Self-Organization — We report an experimental study of the transition to turbulence in a pulsating pipe flow the most important example of pulsating flows is the cardiovascular system where the onset of fluctuations and turbulence can be a possible cause for various diseases such as the formation of aneurysms. The present study is limited to a straight rigid pipe, sinusoidal modulation of the flow rate and a Newtonian fluid. The dimensionless parameters (Womersley and Reynolds numbers) were chosen to include the parameter range encountered in larger arteries. We observe that at large frequencies the critical point for the onset of turbulence remains completely unaffected by pulsation for all amplitudes investigated (up to 40%). However for smaller frequencies (Womersley numbers below 10) the critical point considerably increases. Furthermore we investigate how the transition scenario is affected for a fixed frequency and increasing amplitudes (approaching oscillatory flow).

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