

Abstract Submitted  
for the DPP20 Meeting of  
The American Physical Society

**Implementing the Advanced Annular Couette Centrifuge Method to Optimize Liquid Centrifugation** DEBRA ELLEN KRANZLIN, Fordham University, ERIK GILSON, Princeton Plasma Physics Laboratory — We focus on research and examination of various types of centrifuges used in industries around the world to determine the effectiveness of implementing the Advanced Annular Couette Centrifuge (AACC) technology developed by researchers at PPPL. The AACC method was developed to enhance the separation efficiency of liquid centrifuges by modifying a Taylor-Couette (TC) device. TC flow is the flow of a fluid between two co-axial differentially rotating cylinders. The PPPL method limits secondary flows and turbulence by having end-cap rings spinning at intermediate speeds so that the inner cylinder spinning at higher speeds can create higher effective gravity. The modified TC device can promote mixing or separation by keeping the fluid in one container and adjusting the two rings' speed. An engineering study examines the current applications of traditional centrifuges in agricultural and chemical engineering processes, energy applications, and the separation of sub-micron-sized particles in liquids. This research identifies specific markets where AACC technology can reduce process times and increase cost-efficiency. This new method can be applied to optimize processes and applications of liquid centrifuges used in industries around the world.

Debra Ellen Kranzlin  
Fordham University

Date submitted: 09 Jul 2020

Electronic form version 1.4