

Dufour and Soret effects on Double diffusive Casson fluid flow with the influence of internal heat source

Suma Nagendrappa Nagappanavar^a. and Raghunatha K. R^a.

^aDavangere university, Davanagere, India.

Presented by Suma Nagendrappa Nagappanavar

Corresponding author – nsuma8076@gmail.com

ABSTRACT

The present study examines the influence of the Soret and Dufour effects on the double-diffusive Casson fluid flow with an internal heat source. These effects have practical applications in geothermal energy extraction, cooling of electronic devices, petroleum engineering, and polymer processing. The governing equations are solved using the Bernoulli wavelet method, and the results delineated under the limiting cases are shown to be in agreement with those published previously. The study investigates the impact of various physical parameters on the temperature, velocity, and concentration of the fluid and presents the outcomes in graphical form. In addition, the study provides information on skin friction, Nusselt number, and Sherwood number in tabular format. Overall, the research contributes to a better understanding of the behaviour of non-Newtonian fluids under different thermal and concentration gradients and has practical implications in various industrial processes.