# some problems related to boundary layer flow of micropolar fluids

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In recent years, the study of flow and heat transfer of micropolar fluids has considerableattention of several researches in view of its important applications in several technologicalprocesses, such as cooling of nuclear reactors during emergency shutdown, the extrusionof a polymer sheet, food stuff, cooling of electronic devices, enhanced oil recovery, hotrolling, continuous casting and glass fiber production. Therefore, the aim of this thesis isto investigate some problems related to boundary layer and thin liquid film of micropolarfluids over a surface under different situations. The effects of various physical parameterssuch as, the magnetic parameter, heat generation(absorption) parameter, slip parameter,suction (injection) parameter, Eckert number, Prandtl number, buoyancy parameter, materialparameter and thermal radiation parameter on the flow and heat transfer have beenillustrated and discussed.Applications of these problems can be found in polymer processing technology. Forexample, in the extrusion of polymer sheet from a die, the sheet is sometimes stretched.During this process, the properties of the final product depend considerably on the kinematicsof stretching and the heat transfer rates during the fabrication process. Thekinematics and thermal driving conditions of the real cases have been modelled in mostprocesses by different power-law variations of the stretching velocity. By drawing suchsheet in an electrically conducting fluid subjected to a magnetic field, the rate of coolingcan be controlled and the final product can be obtained with desired characteristics. Also,the combined effect of magnetic field and heat generation are important in many applicationssuch as nuclear reactors, electronic chips, and semiconductor wafers. However,polymer melts often exhibit macroscopic wall slip. The fluids that exhibit the boundaryslip have important technological applications such as in the polishing of the artificialheart valves, polymer processing and internal cavities. We know that the radiation effectis important under many non-isothermal situations. If the entire system involving thepolymer extrusion process is placed in thermally controlled environment, then radiationcould become important. The knowledge of radiation heat transfer in the system canperhaps lead to a desired product with a sought characteristic. Moreover, the flow andheat transfer inside thin films have attracted the interest of many researchers due to theirseveral applications in engineering such as wire and fiber coating, reactor fluidization,polymer processing, food stuff processing, transpiration cooling, gaseous diffusion, heatpipes and fluidic cells of many chemical and biological detection systems.