























effect for all Dufour numbers.

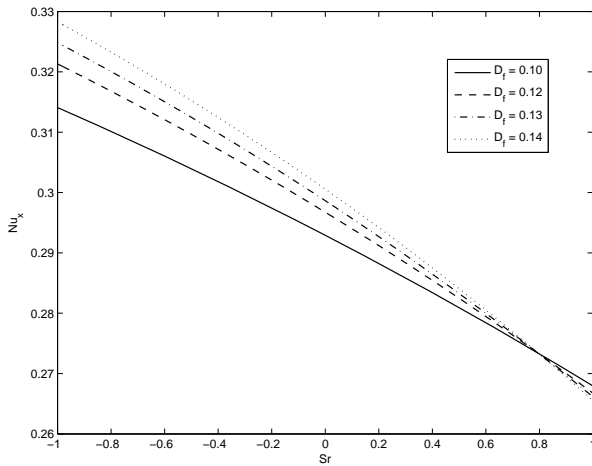


Figure 23: Non-dimensional heat transfer coefficient as a function of  $S_r$  at fixed  $N_1 = N_2 = N_3 = 1$ ,  $Re = 1$ ,  $Pe_h = 1$ ,  $Pe_m = 0.8$

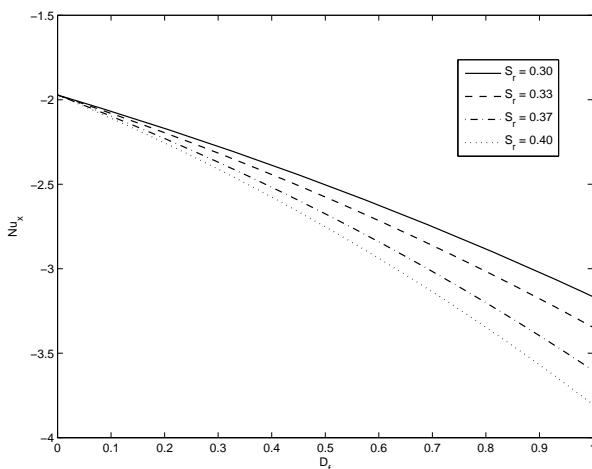


Figure 24: Non-dimensional heat transfer coefficient as a function of  $D_f$  at fixed  $N_1 = N_2 = N_3 = 1$ ,  $Re = 1$ ,  $Pe_h = 6$  and  $Pe_m = 0.5$

## 6 Conclusion

In this paper we have studied the effects of the Dufour, Soret and Peclet parameters on a the heat and mass transfer on a micropolar fluid through a horizontal channel. The analysis shows that the Soret and Dufour parameters have a significant influence on the thermal and solutal boundary layer profiles. The effect of the Peclet numbers on the fluid properties has been determined. Our analysis shows that;

- the increase or decrease in the boundary layer

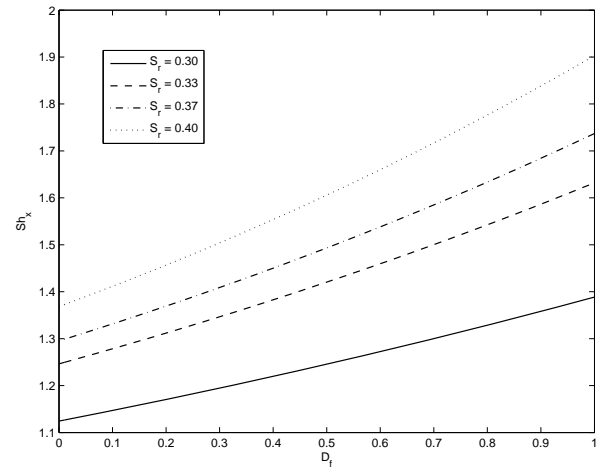


Figure 25: Non-dimensional mass transfer coefficient as a function of  $D_f$  at fixed  $N_1 = N_2 = N_3 = 1$ ,  $Re = 1$ ,  $Pe_h = 6$ ,  $Pe_m = 0.5$

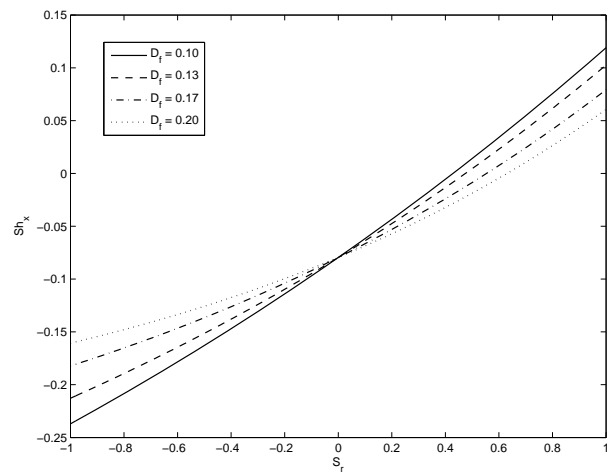


Figure 26: Non-dimensional mass transfer coefficient as a function of  $S_r$  at fixed  $N_1 = N_2 = N_3 = 1$ ,  $Re = 1$ ,  $Pe_h = 6$ ,  $Pe_m = 0.5$

temperature and concentration is dictated by the relative sizes of  $Pe_h$  and  $Pe_m$  in the analysis,

- increasing Reynolds numbers reduces both the velocity and micro-rotation profiles,
- the velocity increases with  $N_1$  whereas the micro-rotation vector decreases with  $N_1$ .

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