MATTER STREAMS IN ALGOL-LIKE SYSTEMS

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ABSTRACT. Simulations of the Algol-like binary CX Draconis, combined with IUE observations of the stream of material escaping the system can place limits on the inclination of the system and give estimates, via line profile synthesis, of the mass-loss rate at the L1 point.

1. INTRODUCTION

The unknown form of the interactions of a plasma with itself makes the task of realistically simulating the flow of matter in interacting binaries very difficult. Perhaps the least uncertain of the available methods which mimic viscous effects is that of Prendergast and Taam (1974) where particle motions are thermalized to a Maxwellian distribution once a given path length has been traversed. Models using this technique have been constructed and, with the data from Koubsky (1978), have been applied to the Be-binary system CX Draconis.

2. RESULTS

The models produce a stream which escapes the system at a phase between 0.25 and 0.35. IUE data show blue-shifted absorption features with a maximum speed of -700 km/s at a phase of 0.25. Comparison with the same speed as computed from the model implies that the inclination of the system is between 51 and 56 degrees.

The models yield the expected mass, velocity and scale-height distributions of the stream and these will be used in future work to synthesize line profiles (of SiIV or AlIII) which, when scaled to the data, will allow the mass-loss rate at the L1 point to be derived.

3. REFERENCES

Prendergast K. H. & Taam R. E., 1974, Ap. J., 189, 125
Koubsky P., 1978, Bull. Astron. Inst. Czech., 29, 288

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