

THE INFLUENCE OF BLENDS ON THE POTENTIAL OF EXTRASOLAR PLANETS TRANSIT SURVEYS

M. Gillon¹, P. Magain¹, T. Guillot², F. Fressin²

¹ Institut d'Astrophysique et de Géophysique, Université de Liège, Allée du 6 Août, 17, Bat. B5C, B 4000 Liège, Belgium

² Observatoire de la Côte d'Azur, BP 4229, 06304 Nice Cedex 04, France

Due to their low geometric probability, planetary transits are rare, and photometric surveys searching for such events have to observe many stars at once and, thus, deal with rather crowded fields. This crowding has two negative effects on the final results of the survey: it decreases the number of detectable transits and increases the number of false positives. We have studied the influence of crowding on different surveys (existing ones as well as planned or even fictitious ones). On the basis of simple but realistic assumptions about the fraction of lower main sequence stars harboring telluric and giant planets within the outer limit of their habitable zone, we predict the harvests of several surveys with and without taking into account the losses due to blends. Our results show that deep surveys such as OGLE-III are much more affected by blends than wide field surveys. Space missions such as Corot and Kepler, although they use very broad PSFs in order to increase the S/N, loose a much lower fraction of transits than deep ground-based surveys. We have also estimated the proportion of false positives in the harvest of the surveys. Thus, our results provide a reliable comparison between the considered surveys.