Paper	*The metallicity dependence of the long-duration GRB rate from host galaxy luminosities* -- arXiv:astro-ph/0606725
Preface	Please find enclosed my review of the paper MN-06-0956-MJ "The metallicity dependence of the long-duration GRB rate from host galaxy luminosities" by Wolf and Podsiadlowski. First my apologies in the delay of this report. While this is a potentially interesting paper, it is unsuitable for publication in its present form. I outline below my main objections and suggestion for the authors.
Comments	The main part of the paper is to compare the luminosity function of core-collapse (CC) supernovae hosting galaxies with the hosts of low-z GRBs (0.2<z<1.0). Authors do not contribute any new data here, but use the samples of Strolger et al (2004) and Fruchter et al (2006). This part of the paper is fine, but suffers from very many very similar figures (Fig.1 to Fig.5, some of these multi-paneled). Authors should decide what their paper is actually trying to say and show only few of the figures that are truly needed to make their point. For example, the entire Fig.5 can be replaced with a sentence of two. But the more basic problem underlying this paper is that authors assume that the luminosity of a GRB-hosting galaxy can be used to deduce its metallicity. That is of course correct for a general population of galaxies, due to the existence of the luminosity-metallicity relation, as it is discussed in this paper. However, that assumption fails rather spectacularly for few GRB hosts for which the metallicity has been measured. For example, Soderberg et al. (2006, astro-ph/0607511) describe the host of XRF 050416a at z=0.6528 (so probably one of the GRBs used by the authors). Its host is a very luminous M_B=-20.3 galaxy, i.e. L_B~0.5 L_*. However, its oxygen abundance is either 7.9 or 8.6, many sigma below what it "should" be given the luminosity-metallicity relation used by the authors. Another example is GRB 990712 at z=0.43, i.e. again in the redshift range used by the author, which has a fairly luminous host with a low oxygen abundance of 8.3 (see astro-ph/0607195). Given that in the cases that we actually have the abundance data the basic assumption used by the authors fails miserably, I would like the authors to address that issue in some detail. That would of course affect the entire paper, and especially the Discussion in Section 5. Some of the discussion in this paper shows a lack of understanding of basic issues in determining the oxygen abundance of the galaxies nebular phase (see the end of Section 5.3). It is well known (and unfortunate) that the various methods of determining log(O/H) still have large systematic offsets between them, so one should only compare the values as determined using the same method. Therefore, complaints about SMC or LMC being metal poor compared to the Tremonti et al. sample, while fitting the Lee et al. relation, result from the fact that the

	Lee et al. relation has an offset from the Tremonti et al. relation. Authors should be aware of such rather basic problems in this particular game before attempting to tackle this rather complex issue. Another issue is the use of Solar oxygen abundance of 12+log(O/H)=8.66. This low value is at best controversial, and while it is only indirectly relevant to this paper, authors should mention that this is still a matter of debate (see astro-ph/0606077, for example). To summarize, I believe there is a good paper to be had here, but we are not there yet. I would be happy to review the revised version of this paper.

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Preface	Dear Dr. Wolf Please note that the latest version of your paper was reviewed by a new referee. Please find below the new reviewer's comments on your revised manuscript entitled "The metallicity dependence of the long-duration GRB rate from host galaxy luminosities", ref. MN-06-0956-MJ.R1, which you submitted to Monthly Notices of the Royal Astronomical Society. Some further, minor revision of your manuscript is requested before it is reconsidered for publication. Comments to the Author I consider the work very good, and I have only very minor comments in addition to those of the previous referee, which I think have been covered in the revision.
Comments	Introduction: The fact that GRB hosts are Lyman-alpha emitters is taken as evidence conflicting the fact that GRBs have higher metallicities than DLAs. This is not obvious. The conclusion of Fynbo et al. (2003) is that GRB hosts are more frequent Lyman-alpha emitters than Lyman-break galaxies at the same redshifts. Lyman-break galaxies (in ground based surveys) are very bright galaxies that hence will tend to have higher metallicity. DLAs on the other hand are selected by cross-section and this will force them to be much fainter, especially as the faint end slope is very steep (see Fynbo et al. 1999, MNRAS). Sect. 3.4 Lack of theoretical predictions is mentioned, but there are some in the literature: - Yoon et al., astro-ph/0606637 (already cited) - Hirschi, R.; Meynet, G.; Maeder, A., 2005, A&A, 443, 581 How do these predictions compare with your models for the Z-dependence of LGRBs? Sect. 4.5 - end of paragraph. Why does the Erb result suggest that LGRBs are biased? See Jakobsson et al. (2005, in MNRAS) for a discussion on whether high-z GRB hosts are consistent with being unbiased or not. The seem consistent with being unbiased, but the sample is sparse. 1st paragraph in Sect. 5.1 - Very faint hosts not observed (isolated dwarfs)? There are examples like the GRB020124 host being fainter than R=29.

	next paragraph in Sect. 5.1 - add Levan et al. (2006) on GRB030115 to the list of red hosts. I think this is the best studied case. Sect. 5.2 - furtherdown in Sect. 5.1 it is stated: "At a fixed metallicity level, we would then expect bursts predominantly from those galaxies with the highest star-formation rate. I do not agree fully on this. It must also depend on the shape of the luminosity function. If the faint end is steep enough, faints hosts could be dominating the integral in the considered metallicity bin. At least I don't see why not. Sect. 5.4: In the sentence "While this object was assigned a much higher host metallicity in a previous analysis (Sollerman et al. 2005)..." it is unclear which object is referred to. Later it is assumed that XRFs are different from LGRBs, whereas muost evidence suggest that they form a continuum with GRBs. Rephrase or better drop 5.4 altogether. That is all.