I have read the Doctoral Thesis of Jakub Ripa with great interest. The Thesis is well written and clearly structured. It presents an in depth analysis of the various populations of Gamma-Ray Bursts as defined by their duration and spectral properties. Also presented is a clear and concise analysis of the cosmological properties of long gamma-ray bursts.
It is fair to say that Jakub's concerted research efforts have produced some very detailed analysis of the properties of gamma-ray bursts, perhaps one the most exciting topic in astrophysics today as evidenced by the fact that more than 5% of all preprints in astrophysics have ``Gamma-Ray Burst'' in their titles. That excitement has attracted internationally acclaimed astrophysicists. So in order to make a contribution, you must be very good. The GRB group at Prague has been long recognized as one who has made important contributions to the field and Jakub clearly continues the tradition with a very carefully drafted thesis. In what follows I give a more specific assessment of the thesis' contents.

GRB Diversity

The manifestations of GRB activity are extremely diverse. GRBs are observed throughout the electromagnetic spectrum, from GHz radio waves to GeV gamma-rays, but until recently, they were known predominantly as bursts of gamma-rays, largely devoid of any observable traces at any other wavelengths. gamma-ray properties provide only one of several criteria for classifying GRB sources. Part of the problem is observational because it is not possible to obtain full spectral coverage in all objects and it is not easy to reconcile a classification based on host galaxy properties with one based on the prompt gamma-ray properties. The major impediment to serious taxonomy is more fundamental. GRBs are heterogeneous objects, especially in their directly observed properties. The success of a classification scheme, I believe, should be measured by the extent to which newly recognized properties distinguish subsets defined by differences in other properties. By this criterion, the taxonomy of GRBs has met with only mixed success.

As new non-gamma-ray selection techniques are introduced (e.g. age of stellar populations in host galaxies or the presence of type Ic supernova signatures), the class boundaries (e.g. short and long duration events) have blurred where the defined subclasses transcend traditional boundaries. On the other hand, many new properties do correlate with old ones. This is all the more remarkable in that the conventional diagnostics (e.g. burst duration) measure properties on scales several orders of magnitude larger than that which we believe to be the characteristic of the powerhouse.

GRB traditionally have been assigned to different classes based on their duration - usually defined by the time during which the middle 50% or 90% of the counts above background are measured. On the basis of this criterion, there are two classes of GRBs - short and long - where ~ 2 s duration separates them. However, as very clearly explained in chapter 3, the situation is far more complicated with intermediate duration events, for example, been claimed to represent a distinctive population in addition to SGRs, X-ray flashes, short bursts with extended emission, very short events and shock-breakouts. In brief, GRB are diverse and their distinct populations should be studied carefully and without theoretical prejudges.

The existence of an intermediate duration population has been studied extensively since the BATSE era but in my opinion, Jakub provides the best analysis so far in the subject. Jakub very carefully and objectively presents the reader with evidence that goes beyond the burst prompt properties alone but rather implements as many environmental properties as it is currently possible - which in my opinion is the only way forward. Although the situation remains controversial, as clearly stated by Jakub, the RHESSI analysis is certainly very suggestive. I can only say that after reading chapter 5 I was convinced that the existence of an intermediate class should be taken seriously. The technical challenge of achieving the sensitivities and sample sizes necessary to distinctive measure the properties of such population should not be understated; neither, however, should the potential rewards.

Cosmology

One of the frontiers of modern cosmology lies at high redshift z~6, when the first non-linearities developed into gravitationally-bound systems, whose internal evolution gives rise to stars, galaxies, and quasars.
As the (temporarily) brightest source of photons in the cosmos, the demise of these first generations of massive stars in GRB explosions defines the challenge of elucidating the end of the cosmic dark ages. Apart from revealing a site of high-redshift star-formation, each such high-redshift burst has the potential to help constrain local element abundances in its host galaxy. In the past few years, claims have been made that long GRBs at high-redshift should be abundant in the observed population of non-identified GRBs. Chapter 6 presents provides clear evidence against such a claim. Although this has been voiced before b other authors, the analysis presented here is certainly more complete.

Future Work

In my opinion, the only weak aspect of the thesis is the lack of a clear vision forward from Jakub. I would like to see what are the questions and new paradigms left for future exploration and how Jakub current set of expertise will help him implement them. I think this is an important exercise as he attempts to establish is own independent research program in addiition to be seeking employment in the near future as a postdoctoral fellow - where I anticipate he will continue to make many lasting contributions to the field.

In view of the above assessment, I give him a high recommendation for his doctorate promotion.

Please do not hesitate to contact me if you require any additional information.