

Interactive comment on “Flood discharge measurement of mountain rivers” by Y.-C. Chen

Anonymous Referee #1

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The results of discharge and flow velocity that are provided for the specific river under flood are amazing. It is a daring operation to measure under these conditions, and with the information it provides, it allows indeed to apply an alternative and rapid method of estimating flood discharge, once the relation between mean and average velocity is established.

My main concern is that the article, in particular in the abstract, but also in the introduction, mixes a claim for a general applicable method with what was observed at one specific location (Nanshih river at Lansheng bridge). This is e.g. reflected in the title “Flood discharge measurement of mountain rivers”. It suggests an investigation for a method that is generally applicable. However it must be noted that the paper does not present results from other rivers, nor does it investigate under what conditions the new method is or is not applicable. Another example of mixing general remarks with case

specific situations is the beginning of the abstract where, without indentifying a site it is remarked that: "previous discharge measurements for mountainous areas were typically based on estimated precipitation" This might be the case for rivers in Taiwan, but not in general.

This paper must focus first of all on its findings and method applied for the Nanshih river at Lansheng bridge. It can only hint at wider application. I find it also misleading that the abstract does not mention that the rapid method, using flow velocity in one vertical only, (called the efficient method) can not right away be applied, but only once the relation between mean and maximum velocity has been established. To establish the relation it needs complete flood discharge measurements over the full cross section, possibly taking several years.

I appreciate the set-up of the section "Introduction", and the set-up of the sections "Flood discharge measuring", "Computation of flood discharge", "Description of study catchment and data", and "Measurement of flood discharge " that are merely restricted to the Nanshih river at Lansheng. Comments in these sections per page are discussed below.

The Section Conclusion needs revision. In fact it gives a summary of the measurement method and calculation procedure and does not add to what was mentioned before. It should much more focus on whether or not the goal was achieved, limitations and shortfalls. In the conclusions (and recommendations) it is well possible to hint at the general applicability and what would be necessary for further investigations.

It is advised that the final version is carefully screened on English grammar, vocabulary and typing mistakes.

Comments per page.

Page 12656 Line 2: "It is composed of a new measurement method, tools and techniques" Applying an ADCP, a heavy weight, and suspension from a bridge is not new

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by itself. I rather prefer the author emphasizes on the strength of the method being that it applies available tools, adapted for flood conditions, rather than claiming a new method. Line 4: “measuring flood discharge from mountain rivers by conventional method is time consuming were typically based on estimated precipitation . . .” This might be so for the specific case investigated, but not in general. Therefore mention that the paper investigates a specific case or write it so that it is applicable in general. Line 10, “Moreover, a novel and efficient method for measuring discharge, which is based on the relationship between mean and maximum velocity” Certainly efficient, not so novel as it is based on the relationship between mean and maximum velocity, which was reported on in earlier publications. I prefer that it is mentioned as well that the method becomes efficient only once the constant relation between mean and maximum velocity is established.

Page 12657 Line 8-11: “Conventional discharge measurement methods first measure velocities and cross sectional areas. The required velocity measurements are obtained by placing a current meter at a desired location.” Mention that this is an often applied method in Taiwan, or give a better overview at this stage of existing other methods e.g. mentioning the slope area method. This is only done on page 12658 line 6-17. If it was to address in general “flood discharge measurements of mountain rivers” also more should have been said about even other methods, such as dilution gauging (e.g. Weiler), or rediscovered techniques as the rising bubble method (e.g. K.P.Hilgersom 2012) and to what extend these are realistically applicable” .

Page 12658 Line 21 “Wireless system”, I assume what is meant is “a wireless data transmission system” Line 22 “The efficient measurement method which makes use (i.e use) of maximum velocity and . . . is developed in Sect 3.” This is the first time the term “efficient measurement system” is mentioned. Rephrase: In Section 3. we introduce our measurement method for flood discharge that we refer to as “the efficient measurement method”. The efficient measurement method makes use of etc . . .

12660 Line 18: “There are still some areas of data missed” should read “areas were

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data is missing”. Line 28: can be monitored

12661 Line 6: Skip the word “humanly”

12663 Line 22: “The y-axis is extremely steady”, i.e. “the location of the y-axis is extremely steady”

12664 Line 1: “Restated, the likely location of the y-axis can be identified using historical data, and the maximum velocity of a cross section can be obtained using the y-axis”. What if there is no such historical data. Line 19: (Rzntz, 1982) must be (Rantz, 1982)

Page 12665 Line 16: Chapter heading 3.4 “Efficient discharge estimation”” Someone reading the chapter headings would not understand this cryptic title What is meant is “Estimation of the discharge by the efficient measurement method” Line 17: “Before the efficient method is developed . . .” Change into: “Before the discharge estimation method, referred to as the efficient measurement method, is developed . . .”

12666 Line 19 – 20 specify over what period the average, min and max were determined Line 25 “the Nanshih river is 45 km long” is this to the bridge ? Line 21 “the bed slope exceeds 10% “ Why 10% .Better to provide the average slope, this is a defined number, and mentioning it is exceeded at several locations.

12667 Line 10. add that the statement made is during the typhoons, as the lines before discuss the situation during a non-typhoon. Line 18 , “cross-section sharp” I suppose what is meant is cross-section shape Line 22, “the discharge was around 411m3s-1” This does not correspond with fig4 where the discharge is 185.27 m3s-1

12675 Table 1 In the first line below the header in the table a decimal dot is missing, i.e. 3086 must read 308.6

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