

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

### **Anonymous Referee #3**

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#### **General comments:**

*The paper applies an interesting method of linking the average stream flow velocity to the maximum flow velocity, with remarkable validation results during adverse weather conditions. However, the author needs to be more specific in the description of previous methods (citing limitations) this would better clarify, to the reader, specifically how the methodology improves flood discharge measurement. The use of the word ‘novel’ should be carefully considered considering that the application of the ADP measurement technique is not new and the author also cites previous studies that correlate the mean and the maximum velocities. In addition, the findings of the study are case specific and can only be generalised if tested on a wide range of cross-section configurations in different rivers. Additionally, the use of the term “accurate method” is questionable given aleatory and epistemic sources of uncertainty affecting river flow*

*measuring systems and observed data. The spelling and grammar throughout the document should be keenly improved prior to publication.*

**Specific comments:**

P12660 L5 A list of limitations for use of the ADP is mentioned. However, in the methodology that was applied the author does not describe mitigation measures that would alleviate the effects of turbulent flow during typhoons (Table 1). Specifically, was any special care taken with reference to high sediment suspension and air entrainment during the measurement?

P12661 L15 It would be interesting discussion for the author to comment on practical probable distances away from the bridge piers that would reduce the effects of the vortices at the bridge piers on the discharge measurement (considering crane arm length)

P12667 L15 and P12668 L5 By superimposing the location of the bridge piers on figure 4 and figure 5, this would probably show the effect of the pier obstruction and increased flow of water below the bridge deck.

P12668 L15 The presentation of the observed scour and deposition would be much more easily visualised as a percentage of the cross-sectional area

**Technical correction:**

P12658 L20 Should be use not used, Should be gauge not 'gage'

P12667 L15 Should be shape not 'sharp'

P12660 L15 Reformulate the statement "Although velocity distribution data can be obtained immediately, there are still some areas of data missed." for clarity

P12664 L5 Reformulate sentence "However ADP cannot sample the velocity near water surface and the velocity distribution is not continue."

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P12667 L5 Adjust the value of the coefficient in the text or in the figure 7 ( $\phi = 0.51$  or 0.50?)

P12667 L15 Adjust equation coefficients to either match the figures 8 and 9, or the text.

P12670 L15 A uniform scale for figure 12 would make it easy to see the difference between the velocity distributions.

P12671 L20 Reformulate the statement, to improve the grammar; “Concerns for personal safety, accuracy, reliability, and efficiency, new measurement method and system have to be developed for flood discharge measurement”

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