Response letter

We thank the Reviewer for the comments, which have helped improve our manuscript. Our responses are in blue.

As human activities continue to expand into deep seas, more requirements are needed for deep-sea search and recovery. Currently, ROVs and HOVs are the main forces for deep sea recovery. Due to the high cost and scarcity of ROVs and HOVs, the authors in this paper proposed a new type of deep-sea recovery system based on TV-grab in oceanography. The quite detailed design and its recovery process are described. Although the new system has not been implemented and tested yet, based on this reviewer's experience, this concept is feasible and can easily be implemented. Therefore, the present concept is of some practical value and to those who have the TV-grabber but lack of ROV and HOV, they can use TV-grabber to carry out the recovery task in an emergency situation. The paper is in overall quite comprehensive and well presented.

Response: We thank the Reviewer for the positive and detailed comments.

In terms of the originality, it is really not so much and in terms of the economic benefit, it is also very limited since TV-grabber is a type of ROV and their operational costs are more or the less the same.

Response: We thank the Reviewer for the comments, however, we do not agree completely with the Reviewer on this point.

(1) A TV-grabber is not an ROV. There is a significant difference between them in deep sea exploration. Only deep-sea Heavy Work-Class ROVs with a tether management system (TMS) can be used for deep sea recovery. This type of ROV is very complex, and it requires a special technical maintenance team, and has a high diving cost [1-3]. On the one hand, a TV-grabber is much simpler, much easier to use, and it is very economical in deep-sea exploration [4,5].

(2) ROVs rely on their manipulators to grab targets, and the load of an ROV is limited, so it can only lift lightweight objects in the ocean [2,3]. On the other hand, most TV-grabs can sample up to 1000 kg or more at a time [4,5], and the maximum weight of our new deep-sea recovery system for lifting a lost target is up to 1000 kg in water.

(3) Our new deep-sea recovery system is based on the design idea and working mode of TV-grabbers, but it is not a TV-grabber. It is specially designed for deep sea recovery.

Compared with ROVs, our new deep-sea recovery system can provide low-cost and rapid deep-sea recovery. Thus, our new deep-sea recovery system can bring much more benefits.

[1] https://en.wikipedia.org/wiki/Remotely_operated_underwater_vehicle.
[2] Martin, A.Y.: Unmanned maritime vehicles: Technology evolution and implications, Marine Technology Society Journal, 47, 72-83, 2013.
[3] Schilling, T.: 2013 state of ROV technologies, Marine Technology Society Journal, 47, 69-71, 2013.
[4] http://www.ifm-geomar.de/

[5] Clark, M. R., Consalvey, M., Rowden, A. A.: Biological sampling in the deep sea, Wiley-Blackwell, New Jersey, 207-227pp., 2016.

In terms of the technical contents, this reviewer thinks it is not ocean science scope but ocean technology scope. Therefore, it is recommended for rejection in this journal but the authors are suggested to submit to the technology scope journal.

Response: We thank the Reviewer for the comments, however, we do not agree completely with the Reviewer on this point. On behalf of the NHESS Editorial Board, Natascha Töpfer encouraged us to resubmit our manuscript to Ocean Science on July 18, 2018. In her email, she stated, "You are encouraged to consider a resubmission of your manuscript to a related journal: https://editor.copernicus.org/OS/transfer/nhess-2018-188". The website section of Ocean Science detailing subject areas clearly shows that "The journal covers instrument development, in situ observations, remote sensing, data assimilation, laboratory, and numerical and theoretical studies", and "The coverage of the journal is worldwide and includes the deep ocean, the shelf seas, and inland seas, now, in the past, and the future." Thus, although our manuscript is not a pure ocean science research, such as ocean currents and eddies, it is still in line with the Journal's subject areas.

Some other minor corrections and suggestions are given in the attached PDF file.

Response: Following the comments in the PDF file, we have revised the manuscript as listed below.

Page 1 Line 14: Corrected.

Page 1 Line 15: please give some examples for the difficulties. "(*such as the requirement of a special technical maintenance and protection team, very high diving cost*)" has been added.

Page 2 Line 3: Corrected.

Page 2 Line 5: Corrected.

Page 2 Line 9: Here, several more earlier examples are given, especially the recovery of H-Bomb and the sunk ALVIN submersible. "*Alvin spent three months searching for the unexploded H-bomb on the Mediterranean Sea floor before locating it and enabling it to be recovered by an ROV into in 1966.*" has been added.

Page 2 Line 22: Corrected.

Page 3 Line 8: Corrected.

Page 4 Line 7: please also give some examples and references here, e.g. Deepsea challenge expedition. "*For example, China has lost its lander system in COMRA 37th Cruise on May 3, 2016. The reason is that the float balls were broken by the ship propeller, causing the buoyancy to be less than gravity and sinking into the sea floor (Cruise Site Command, 2016).*" has been added. "*Cruise Site Command: The site report of the COMRA 37th Cruise, Xiangyanghong 09, 2016.*" has been added to References.

Page 5 Line 9: Corrected.

Page 7 Line 27: Corrected.