Interactive comment on "Efficient Online Source Identification Algorithm for Integration within Contamination Event Management System" *by* Jochen Deuerlein et al.

Anonymous Referee #2

Received and published: 9 May 2017

Dear Editor

the paper proposes an algorithm for the identification of the source of a contamination and its integration within a real-time management system. The paper deals with a hot topic in the field of water distribution system and so it is interesting for operators, also because it presents a novel software that can be very useful for the water utilities. However, the paper is not clear in some parts, but it can be improved and so published if the Authors will take into account some major and minor revisions.

Major Comments:

1) Introduction is poorly written with a limited state of art about the topic of water distri-

bution system protection from contamination. More than half of the abstract is devoted to the developed software. It is important to describe better the state of the art (both in terms of contamination risk and in terms of methodology to face the problem) and previous papers that deal with the problem of source identification. The following works can be related to the paper topic (in which several other papers can be found in the references):

a) Chang, N.-B., Pongsanone, N.P., Ernest, A. (2011). Comparisons between a rule-based expert system and optimization models for sensor deployment in a small drinking water network Expert Systems with Applications, 38 (8), pp. 10685-10695.

b) Hall, J., Zaffiro, A.D., Marx, R.B., Kefauver, P.C., Radha Krishnan, E., Haught, R.C., Herrmann, J.G. (2007). On-line water quality parameters as indicators of distribution system contamination Journal / American Water Works Association, 99 (1), pp. 66-77.

c) Di Nardo, A., Di Natale, M., Musmarra, D., Santonastaso, G.F., Tzatchkov, V., Alcocer-Yamanaka, V.H. (2015). Dual-use value of network partitioning for water system management and protection from malicious contamination, Journal of Hydroinformatics, 17 (3), pp. 361-376.

2) The description of the methodology and the model are confused (maybe because too "compressed") and some parameters are not explained – page 2, equation 1a (e.g. ct and cx). Are they refuse? Please check to make paper consistent and more clear. I suggest to use a flow chart to improve the methodology description.

3) Page 4, line 24: "based on a worst case assumption of a unique source location is selected ....", taking into account the different hypothesis and the simplified model used, is realistic to focus on a unique source location or it will be better to identify an area on which focus on the attention?

4) Page 5, line 9: "In the following section the SI algorithm is demonstrated using the example of the test network in Zurich (Fig. 1).". It should be interesting to provide

some information about this water distribution network, and above all, it should be more attractive to test the algorithm on a real system.

Minor revision:

1) Page 1, line 2: "Whilst a number of algorithms have been published on the algorithmic development . . .", please change.

2) Page 1: please pay attention to the sequence of tenses.

3) Pay attention to reference format in the text, (e.g. page 2, line 8 – ".... software tools can be found in [7]", while at page 3, line 10 "... page 6, line 12 "... of possible source candidates (see for comparison De Sanctis et. al., 2010)".

4) Pay attention to reference in the text; at page 2, line 8 is reported the seventh reference, where are the previous six? Please check. Furthermore, the references at the end of paper are not numbered.

5) Page 3, line 10: Shang et al, (2002), is not reported in the references list.

6) I suggest improving the English language.

7) I suggest improving the quality of figures.

8) Figures are very large; if the authors reduce their dimensions they can save space for better explain the methodology and the results.