

Ocean Sci. Discuss., referee comment RC2
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Comment on os-2021-115

Anonymous Referee #2

Referee comment on "Coastal high-frequency radars in the Mediterranean – Part 2: Applications in support of science priorities and societal needs" by Emma Reyes et al., Ocean Sci. Discuss., <https://doi.org/10.5194/os-2021-115-RC2>, 2022

General comments

This paper presents an extensive review of many different and important applications of HF radar in the Mediterranean. Other reviews of this type have been published, and are referenced in this paper, but I think this is the first one that focusses on this particular region. As a review it is not intending to present new science but it brings together in an interesting way many different scientific contributions and developments, as well as some operational applications, all well-referenced and acknowledged. I did occasionally get lost in some of the detail and felt that there was some unnecessary repetition of key HFR advantages (high temporal and spatial resolution for example) when addressing each of the different applications.

Although I am providing a long list of suggested modifications to the English, on the whole the paper is well-written and will be of interest to many, and not just to those working in the Mediterranean region.

Specific comments

- To make it easier to navigate through the paper it might be helpful in section 2 to list the subheadings of the three main topics in an introduction to the section. The key features of HFR that support these applications could perhaps be included in this introduction so they do not need to be repeated elsewhere.
- Fig 14 and associated discussion. I couldn't relate what I can see in (a) and (b) to the discussion on page 31. Can the link between them be made more clearly?
- I am not sure why the mathematical underpinning of lagrangian transport is included here (equations 1 and 2) when such details for other methods reviewed in the paper are not – and do not need to be.

- There is no specific discussion in here about the different types of HFR and their relative merits. Perhaps that is in the companion paper which I haven't seen yet. For most of the applications which involve currents this may not be necessary but when it comes to mapping waves and winds the type of radar is more important so a few words where these measurements are referred to would be useful.
- In connection with section 4 item I on funding. If European HFR networks are to be truly sustainable there needs to be long term infrastructure funding at national, regional and European government level with financial input from other operational users through regional consortia. Relying on grant funding, particularly where this is focussed on new science, will not be sufficient.

Minor corrections/suggestions

- Abstract li35-36. I would suggest a slight rewording for clarity 'The Mediterranean Sea is a prominent climate change hot spot, with many socio-economically vital coastal areas being the most vulnerable targets for maritime safety, diverse met-ocean hazards and marine pollution.' Or something like that.
- P2 li 40. Remove 'the' in 'in the Coastal Ocean'.
- P2 li 46. Remove 'finally'.
- P2 li 47. Replace 'societal' with 'societally'.
- P2 li 56. Remove 'the' after 'covering'.
- P2 li 58. 'Both not really needed.'
- P4 li 116. Remove 'et al' after Wyatt. Reference lists shows just one author.
- P4 li 124. Replace 'It is worth to highlight' by 'It is worth highlighting'.
- P4 li 130. Rearrange 'providing the first one a' to 'the first one providing a'.
- P4 li 135. Remove 'the' before 'Sect.4'.
- P5 li 155. Replace 'highly' with 'greatly'. Replace 'its high' by 'their high' and 'its near' by 'near'.
- P5 li 160. Replace 'control' by 'controlled'.
- P6 li 170. Replace 'from which' with 'of which'.
- P6 li 176. 'accounts with?? do you mean 'has'
- P6 li 178. Replace 'being the 51% from' with 'of which 51% were from'.
- P6 li 179-180. Rewrite as 'In particular, the number of SAR incidents in the French Mediterranean responsibility area accounts for 23% (3110) of the total number of cases and 32% (7293)'.
- P6 li 181-182. Remove 'The' before '94%' and replace 'being more of' with 'with more of'.
- P6 li 186. Replace 'for 1875' with 'to 1875'.
- P6 li 192. Replace 'being also' with 'with'.
- P6 li 194. Remove gap in '267 874' for consistency with large number notation elsewhere (or perhaps include a hyphen if that was missing?).
- P 6 li 195-196. Rewrite as '...reported as SAR cases occurring within Maltese Territorial Seas'.
- P6 li 198. Rewrite end of sentence from 'are served by..' I am not sure what is meant here.
- P7 li 204. Replace 'from' with 'of'.
- P7 li 205. Rewrite as '(the remaining 12% being in response to ...'.
- P7 li 206. Replace 'From 7 of the HFR' by 'Of the 7 HFR'
- P7 li 222. Replace 'obtaining' with 'for'
- P11 li 282. Replace 'issues as' by 'issues such as'/'
- P11 li 283. 'for instance' not really needed.

- P12 Fig 4 caption. Is CC index the same as complex correlation coefficient?
- P13 li 362. 'only a limited number of studies have been'.
- P14 Fig 5. I can't see a definition of 'CR'?
- P15 li 408. Insert 'an' between 'using' and 'unsupervised'.
- P15 li 411. I don't think prerequisite is a verb. Suggest 'requires' or 'assumes' instead.
- P16 li 420. Replace with 'the HFR systems has had substantial problems since 2010 and the antennas were eventually removed.'
- P17 li 446-447. Perhaps rewrite as 'The analysis was based on pattern and magnitude estimates of kinematic properties from surface currents'
- P17 Fig7. The whole figure should be on one page rather than spilt up. The font size on the maps is too small to read clearly.
- P18 li 469. Replace 'analyzing' with 'analysis of'.
- P19 ;I 474. Replace 'the flash pressure drops' by the sudden pressure drop'.
- P19 li 485-486. Unit split across lines.
- P21 li 542. Replace 'damages' with 'damage'.
- P22 li 559. Remove 'a' before 'software'.
- P22 li 570. I suggest 'into the ocean, multi-scale coastal ocean dynamics being the key drivers...'
- P22 li 571. 'HFRs have demonstrated a capacity to provide very'
- P23 li 580. Replace 'threat' with 'threats'.
- P24 li 617. Replace 'state for' with 'are' and define the x' variable at the end of the sentence. Although see also
- P24 li 630. 'Moreover' not needed.
- P25 li 648. 'Besides' not needed.
- P29 ;I 743. 'Furthermore' not needed.
- P29 li 751. I suggest rewrite as 'for all seasons except spring, although some were able to'
- P31 li 776. Remove 'at the'..
- P32 Fig 14. Map font sizes are too small.
- P32 Fig 14 caption li 797. Delete 'as'
- P32 li 808. Replace 'determinant' with perhaps 'important' or 'most important' or ...
- P33 li 830-831. Either 'physically driven' or 'physical driving'.
- P34 li 842. Replace 'along' with 'in'.
- P34 Fig 16. I can't find a link to Fig 16 in the text although presumably it should be on this page.
- P35 li 863. Remove 'the' before 'Fig'.
- P36 li 880-881. Suggest rewriting as '....'and making routine maintenance tasks easier under these severe...'
- P36 li 881. Rewrite as 'it is worth highlighting that under...'
- P36 li 887. Replace 'still' by 'yet'.
- P36 li 890. Remove 'as usual'.
- P36 li 902-903. I wasn't sure what the phrase beginning 'models, being these..' was getting at. Perhaps replace with 'models, which in turn will benefit from the future expansion of the HFR network'.
- P37 Fig 17. The fact that HFR is a surface measurement and many applications require currents at depth (as mentioned in the text) could perhaps be added as a weakness. And I was not sure what 'Lock (should this be lack?) of the HFR data potential' means? I'm not sure why 'lower HFR frequencies than is usual in the Med' is a threat. HFRs operating at lower frequencies are available. Perhaps a weakness of the current network?
- P38 li 919. 'Finally' not needed'
- P38 li 935. Remove 'the' at the end of the line.
- P 38 li 943-944. Suggest rewriting as ' Accordingly a review of major scientific and social questions is needed including the environmental....'
- P39 li 969. I suggest something like ' held by companies or controlled by arrangements with the private sector'. I'm not sure what 'compromised to' means.

- P40 li 986. I am stumped. What does 'different compartment' mean?
- P40 li 996. A recent paper on applications to offshore wind power could perhaps be included in this list <http://dx.doi.org/10.21926/jept.2101005>.
- P40 li 1003. Suggest a full stop after 'sustainability' followed by 'It'.
- P40 li 1011. Suggest moving 'will offer' to after 2022.
- P42 li 1071. Replace 'ones' by 'some'.
- P43 li 1087. Replace 'increasingly' with 'increasing'.