General comments:

The manuscript entitled, "*The ddeq Python library for point source quantification from remote sensing images (Version 1.0)*," summarizes the capabilities of a new open-source Python library designed to estimate greenhouse gas emissions rates from point sources and cities using a variety of different methods. This software represents a substantial contribution to the field and the lightweight methods used are valid and described by an appropriate amount of detail. The library was relatively easy to install, and the example Jupyter Notebooks are useful. The manuscript is very well-written, and I recommend publication after minor comments are addressed.

1. The manuscript would benefit from more discussion on wind, as wind speed and direction errors are one of the largest contributors to emission rate errors. The code can download ERA5 winds, but it is not clear where wind_speed_precision comes from (presumably ERA5 as well) or if it is a good estimate of the true error. Additionally, a brief discussion on the effective wind speed (*u)* would be appreciated. For example, how it is calculated and how it varies depending on instrument pixel resolution.

2. Some discussion on background uncertainty, where appropriate, would also improve the manuscript. S3.3 mentions "uncertainties in the background" but more detail is needed, as this is another important source of error in emission rate estimates. Background uncertainty does not appear to be included in the uncertainty terms at this time, e.g., in S3.4.5, "The uncertainty of the emissions is calculated by propagation of uncertainty from the random uncertainty of the gas columns and the wind speed."

3. This is certainly beyond the scope of the manuscript and Version 1.0 of *ddeq*, but it would be great to have support for OCO-2/3 XCO_2 data in a future release!

Specific comments:

S2.3.2: "Furthermore, assuming that different trace gases share the same distribution in lateral direction, the method can be expanded to use the standard width and center position estimated for one trace gas directly when fitting the Gaussian function for another gas. This is particularly attractive for the combination of NO2 and CO2 observations..."

Can the same width always be used when combining NO_2 and CO_2, or do you need to take into account the NO_2 decay as you get further from the source?

S2.5: "Nassar et al., 2022"

You may also consider citing Hill and Nassar, 2019 (https://www.mdpi.com/2072-4292/11/13/1608)

S3.4.2: "or when the emission rate is smaller than 0.1 times or larger than 1.9 times the prior expected emission rate"

What about a scenario where the prior expected emission rate is highly uncertain (e.g., in an undeveloped nation)? Perhaps these limits would be too constraining.

S3.4.6 L457: "In the first step, the XCO_2"

Is this just for CO_2, or also NO_2? It's also the only time **X**CO_2 is mentioned in the manuscript, so you'd need to define it.

S3.4.6: "the statistical error of the emission field is also considered."

Perhaps explain this a bit more.

S4: "As information on emissions from hotspots can be sensitive"

Please be more specific on what you mean by sensitive here.

tutorial-introduction-to-ddeq.ipynb:

Running the latest release of *ddeq* (via $pip install ddeq), cell 16 fails with "AttributeError: Module 'scipy' has no attribute 'vectorize'". It looks like era5.py L500 should have "np.vectorize" instead of "scipy.vectorize". This causes issues in other notebooks too.

Technical corrections:

L94 "distance along **or** perpendicular"
L108 "**chemically** inert"
L176 "are **the** location"
L176 "the **extent** of the area source"
L259: define "LCSF"
L275: "location of sources used **is** known"
L277: define "CSV" here and not on L280
Figure 5: the CO_2 and NO_x emission estimates in the figure do not match those listed in the figure caption.
L308: "GP, CSF and IME method**s**"
L333: "method**s**"
L360: define "COSMO"
L390: "to **constrain**"
L394: "~~aka:~~ random uncertainty"
L477: "in **the** future"
L496: "in **the** future"
L507: define "CORSO"
L509: define "ARES"
L513: "prototype systems for anthropogenic emission monitoring ~~system~~"