This paper provides a comprehensive overview of a seven-year high-frequency, multi-elemental stream water monitoring program (Riverlabs) in France. The study offers valuable technical and organizational insights that can benefit researchers and practitioners in high-frequency water quality monitoring. However, several areas require improvement to enhance clarity, depth, and generalizability.

General Comments

1. The abstract should explicitly highlight the innovative aspects of the Riverlab approach, particularly in sampling, filtration, and analysis, compared to existing high-frequency water quality monitoring methods. Additionally, the practical applications of the findings in improving water quality assessments across diverse hydrological settings should be clearly stated.
2. The introduction should provide a more comprehensive literature review on recent advancements in sensor technology, automated data processing, and filtration systems for high-frequency monitoring. Additionally, a stronger justification for the selection of the three catchments is needed, emphasizing their hydrological diversity and relevance. The introduction should conclude with a clear research hypothesis and expected contributions to better guide the reader.
3. Section 4.3 on Data Management and Software should include a more detailed discussion on challenges related to data interoperability, software compatibility, and synchronization when integrating multiple platforms. Furthermore, concerns regarding data security, such as access control, encryption, and backup strategies, should be addressed to ensure the protection of sensitive environmental data.
4. The study should provide a structured discussion on the generalizability of the Riverlab approach to different catchments, including arid regions, carbonate-dominated landscapes, and urbanized watersheds. Additionally, potential modifications required for scaling up the system to larger and more complex hydrological settings should be considered.
5. The conclusion should synthesize key technical and organizational lessons learned from the Riverlab experience and highlight their practical implications. Additionally, future research directions should be discussed, including the potential for next-generation sensors, artificial intelligence-driven data analysis, and remote sensing applications to further enhance high-frequency water quality monitoring.

Specific Comments

1. L111–117: Discuss the rationale behind selecting surface vs. submersible pumps, linking this choice to hydrological and sedimentological characteristics of each catchment.
2. L310–315: Provide more details on the detection methods for calcite precipitation in Orgeval and pH sensor degradation in Strengbach, along with their long-term impacts on data quality and measurement accuracy.

3. L376–378: Include quantitative data on the frequency and nature of maintenance issues, such as pump failures, sensor recalibrations, and filtration blockages, to better illustrate the operational demands and challenges of maintaining Riverlabs.
4. L505–510: Clarify the empirical adjustments made to system components based on field conditions. If no standardized protocols exist, discuss the feasibility of developing operational guidelines to optimize future monitoring deployments.