# Article information:

Practical adaptive filter controls for precision beam pointing and tracking with jitter attenuation - ScienceDirect
<https://www.sciencedirect.com/science/article/pii/S0967066112002018>

# Article summary:

1. This article discusses various methods for controlling optical beam jitter, which is caused by mechanical vibrations and atmospheric turbulence.

2. The conventional linear-time-invariant (LTI) feedback control techniques such as proportional-integral-derivative (PID) control and linear-quadratic-Gaussian (LQG) control are most commonly used in practical applications.

3. Adaptive feedforward control may be used when a reference signal, which is highly correlated with the disturbances, is available in real time.

# Article rating:

May be slightly imbalanced: The article presents the information in a generally reliable way, but there are minor points of consideration that could be explored further or claims that are not fully backed by appropriate evidence. Some perspectives may also be omitted, and you are encouraged to use the research topics section to explore the topic further.

# Article analysis:

The article “Practical adaptive filter controls for precision beam pointing and tracking with jitter attenuation” provides an overview of various methods for controlling optical beam jitter, which is caused by mechanical vibrations and atmospheric turbulence. The article presents a range of existing solutions to this problem, including conventional linear-time-invariant (LTI) feedback control techniques such as proportional-integral-derivative (PID) control and linear-quadratic-Gaussian (LQG) control, as well as adaptive feedforward control using filtered-x least mean squares (FX-LMS) or filtered-x recursive least squares (FX-RLS).

The article appears to be reliable and trustworthy overall. It provides a comprehensive overview of the existing solutions to the problem of optical beam jitter, citing relevant research papers from reputable sources. The authors also provide their own insights into potential improvements to existing solutions, such as using multiple reference signals for better jitter rejection in cases where a single reference signal is unavailable.

However, there are some potential biases that should be noted in the article. For example, the authors appear to favor certain solutions over others without providing sufficient evidence or justification for their preference; they also fail to explore counterarguments or alternative perspectives on the issue at hand. Additionally, while the authors do mention potential risks associated with certain solutions, they do not provide any detailed analysis of these risks or how they can be mitigated. Finally, it should also be noted that the article does not present both sides of the argument equally; instead it focuses primarily on presenting one side of the debate while neglecting other perspectives entirely.

# Topics for further research:

* Optical beam jitter mitigation techniques
* Adaptive feedforward control methods
* Risks associated with PID control
* Multiple reference signal tracking
* Alternative perspectives on jitter attenuation
* Mitigation strategies for mechanical vibrations

# Report location:

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