# Article information:

A frequency compensation scheme for LDO voltage regulators | IEEE Journals & Magazine | IEEE Xplore
<https://ieeexplore-ieee-org.tudelft.idm.oclc.org/document/1304961>

# Article summary:

1. Low dropout (LDO) regulators are popular for their efficiency, but they have high output impedance which creates a low frequency pole and decreases overall phase margin, leading to potential instability.

2. A compensating circuit using capacitive feedback can introduce a left hand plane zero in the feedback loop to replace the zero generated by ESR of the output capacitor, improving stability without significantly increasing power consumption or die area.

3. The proposed topology successfully overcomes stability problems in LDO voltage regulators and improves both transient response and noise performances.

# 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 provides a comprehensive overview of the stability problems associated with low dropout (LDO) voltage regulators and presents a modified LDO voltage regulator topology that overcomes these issues. The article discusses the tradeoffs between switch mode and linear regulators, highlighting the advantages and disadvantages of each. It also explains how LDO regulators offer higher efficiency but compromise on stability due to their high output impedance.

The article provides a detailed analysis of the stability issues associated with LDO regulators, including the presence of multiple low-frequency poles that need to be taken into consideration when evaluating the frequency response of the regulator's closed-loop transfer function. The article also discusses various solutions proposed in prior art to overcome these issues, including charge pump voltage boosters, pole-splitting techniques, and Miller compensation schemes.

The proposed solution presented in this article involves introducing capacitive feedback to introduce a left-hand plane zero in the feedback loop that replaces the zero generated by ESR of the output capacitor. The article provides a detailed explanation of how this solution works and how it overcomes the stability issues associated with LDO regulators.

Overall, the article appears to provide a balanced and unbiased analysis of LDO voltage regulators' stability issues and proposes a viable solution to overcome them. However, some potential biases may exist as the authors are affiliated with academic institutions that may have an interest in promoting their research findings. Additionally, some counterarguments or alternative solutions may not have been explored fully in this article.

# Topics for further research:

* Switch mode vs. linear regulators: pros and cons
* LDO regulator stability issues: causes and solutions
* Charge pump voltage boosters: effectiveness and limitations
* Pole-splitting techniques: advantages and disadvantages
* Miller compensation schemes: how they work and when to use them
* Left-hand plane zeros: applications in feedback control systems

# Report location:

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