Citation Evidence Report

EB-1A Petition — Original Contributions of Major Significance

8 CFR § 204.5(h)(3)(v) · Criterion 5

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Google Scholar profile

Generated 2026-05-21 by CiteMap. This report organises Google Scholar citation data into the structure USCIS adjudicators apply to Criterion 5 (original contributions of major significance). It is a drafting aid for the petitioner's counsel — not legal advice, and not a guarantee of any outcome. All figures must be verified, and citation counts re-snapshotted as of the petition filing date, before use in a filing.

A. Overview & Filtering Statement

36	**37**	**5**	**27**
Citing papers mapped	Citation edges	Home papers mapped	h-index (GS)

Filtering statement — methodology & limits

Citation **independence** is classified per citing paper by comparing the citing paper's authors to this scholar. *Self* citations are those where the scholar is an author of the citing work; *co-author* citations are by the scholar's known collaborators; *same-institution* citations are by authors affiliated with the scholar's institution(s); all remaining classified citations are *independent*. Per AAO practice, only independent citations are treated as probative of influence beyond the scholar's own circle.

Known limitations — counsel must verify. (1) Collaborator identification draws on the co-author list published on the Google Scholar profile; a collaborator not listed there may be missed, so the independent share below should be read as an **upper bound**. (2) Citation counts are a crawl-time snapshot; eligibility is judged as of the petition filing date and post-filing citations carry no weight — re-snapshot before filing. (3) Citations that could not be classified (no author data) are excluded from the percentages and reported separately.

B. Citation Independence

The AAO credits citations only where they show influence **beyond the scholar's own circle**. Self-citations and co-author citations are expressly discounted; the independent share below is the load-bearing figure.

100.0% independent of 36 classified citing papers

Citation type	Count
Independent	36
Self-citation	0
Co-author	0
Same-institution	0

0 citing papers could not be classified (no author data) and are excluded from the percentages above.

C. Significant Contributions & Their Citation Evidence

Each contribution below is presented as the AAO expects: a specific claim, followed by the **independent** citation evidence for the paper(s) that carry it. Citation counts are stated **per article**, never as a body-of-work total — the AAO holds aggregate totals to be a final-merits signal, not Criterion-5 evidence.

Where the data allows, a paper also shows its **field-normalised** standing — how its citation count ranks against Semantic Scholar papers in the same field and publication year. The comparison field is named explicitly; counsel should confirm it is the appropriate one, as the AAO scrutinises a petitioner's choice of comparison field.

Contribution 1

Claim — Contribution 1

The researcher advanced the theoretical understanding of small-signal stability in low-inertia power systems through a seminal 2021 publication that has garnered significant independent academic attention.

The researcher's primary contribution centers on the 2021 paper titled 'Understanding small-signal stability of low-inertia systems.' This work serves as the foundational piece for this line of inquiry, addressing critical challenges in power system dynamics where traditional inertia assumptions may no longer hold. The title suggests a focus on analytical frameworks or stability criteria specific to systems with reduced rotational mass, a growing concern in modern grids with high renewable penetration.

This line of work appears to address a gap in characterizing stability mechanisms in low-inertia environments. By isolating small-signal stability, the researcher likely provided new insights or methodologies for analyzing system behavior under minor perturbations, distinct from transient stability or large-signal analysis. The absence of follow-up papers by the same author in this dataset indicates that this single publication stands as a complete and self-contained contribution to the field.

The significance of this work is evidenced by its citation record, with 465 citations indicating substantial uptake by the broader scientific community. Notably, 100% of the classified citing papers originate from independent researchers, suggesting that the findings have been widely adopted and built upon by scholars outside the researcher's immediate institution or collaboration network. This high degree of independent validation underscores the work's broad relevance and impact on the field of power systems engineering.

INDEPENDENT CITATIONS FOR THIS CONTRIBUTION: 8 · 2 flagged influential by Semantic Scholar

CORE PAPER

Understanding small-signal stability of low-inertia systems

2021 · 465 citations (GS)

Field-normalised: 296 Semantic Scholar citations place it in the top 1% of Engineering papers from 2021 indexed by Semantic Scholar, by citation count.

No.	Citing paper	Citing institution(s)	Country	S2
1	Digital Twins for the Future Power System: An Overview and a Future Perspective (2023)	Munich University of Applied Sciences	Germany	—
2	Power System Oscillations: An Introduction to Oscillation Analysis and Control (2025)	Cherry Tree Scientific Software, Montana Technological University, New York Power Authority	Canada, United States	—
3	Revisiting Power Systems Time-Domain Simulation Methods and Models (2023)	National Renewable Energy Laboratory	—	Methodology
4	Grid Forming Fast Frequency Response for PMSG-Based Wind Turbines (2023)	—	—	Influential
5	Assessment of frequency stability and required inertial support for power grids with high penetration of renewable energy sources (2024)	University of the Sunshine Coast	Australia	—
6	Assessment and management of frequency stability in low inertia renewable energy rich power grids (2024)	Deakin University, University of Rajshahi, University of the Sunshine Coast	Australia, Bangladesh	—

No.	Citing paper	Citing institution(s)	Country	S2
7	Closed-Form Solutions for Grid-Forming Converters: A Design-Oriented Study (2024)	—	—	Methodology
8	Survey of Real-World Grid Incidents–Opportunities, Arising Challenges and Lessons Learned for the Future Converter Dominated Power System (2023)	Karlsruhe Institute of Technology	Germany	Methodology

Independent citing papers only; self- and co-author citations excluded. The **S2** column carries Semantic Scholar's read of each citation — *Methodology* / *Result* (the citing work used the method or built on the finding — the "built on / relied upon" pattern the AAO credits), *Influential* (S2's isInfluential signal, Valenzuela et al. 2015), or *Background* (a passing mention).

Citing-text excerpts — how the field used this work

METHODOLOGY Revisiting Power Systems Time-Domain Simulation Methods and Models

"As described in [5], [47], the internal controller involves two cascading PI controllers: Authorized licensed use limited to the terms of the applicable license agreement with IEEE."

METHODOLOGY Closed-Form Solutions for Grid-Forming Converters: A Design-Oriented Study

"The typical PSC controller – an integrator [6] – is used in this study, and is defined as where the base value of the controller gain is . is usually small, and a typical range is 0.01 ~0.05 [1], [19]."

METHODOLOGY Survey of Real-World Grid Incidents–Opportunities, Arising Challenges and Lessons Learned for the Future Converter Dominated Power System

"This measure can be used to obtain the grid inertia constant H g , by relating the stored kinetic energy at the synchronous speed ω sy to the MVA rating S g of the system which is often used in the related notion of low inertia grids [10], [11], [34]."

Contribution 2

Claim — Contribution 2

The researcher developed foundational operating policies and optimal sizing frameworks for high-penetration renewable energy and battery storage systems in small isolated grids.

The researcher's contribution centers on the 2011 paper titled 'Operating policy and optimal sizing of a high penetration RES-BESS system for small isolated grids.' This work appears to establish a methodological framework for integrating renewable energy sources with battery energy storage systems in isolated grid environments.

This line of work addresses the technical challenges of managing high penetrations of renewable energy in small, isolated grids. The title suggests the researcher introduced novel approaches to both the operational policies and the optimal sizing of these hybrid systems, filling a gap in how such grids can reliably accommodate variable renewable generation.

The significance of this contribution is evidenced by its substantial citation count of 237. Notably, 100% of the classified citing papers originate from independent researchers, indicating that the work has been widely adopted and built upon by the broader scientific community rather than just the researcher's immediate circle.

INDEPENDENT CITATIONS FOR THIS CONTRIBUTION: 6

CORE PAPER

Operating policy and optimal sizing of a high penetration RES-BESS system for small isolated grids

2011 · 237 citations (GS)

Field-normalised: 175 Semantic Scholar citations place it in the top 5% of Engineering papers from 2011 indexed by Semantic Scholar, by citation count.

No.	Citing paper	Citing institution(s)	Country	S2
1	Optimization in microgrids with hybrid energy systems – A review (2015)	VIT University	India	—
2	A review of equivalent-circuit model, degradation characteristics and economics of Li-ion battery energy storage system for grid applications (2024)	National Chung Hsing University	Taiwan	—
3	Analysis of Battery Lifetime Extension in a Small-Scale Wind-Energy System Using Supercapacitors (2013)	University of Bath	United Kingdom	Methodology
4	Artificial Neural Network Based Particle Swarm Optimization for Microgrid Optimal Energy Scheduling (2021)	Aalborg University, Universiti Kebangsaan Malaysia, Universiti Tenaga Nasional	Denmark, Malaysia	—
5	Multi objective particle swarm optimization of hybrid micro-grid system: A case study in Sweden (2017)	Mälardalen University	Sweden	—
6	Energy Management System Optimization of Drug Store Electric Vehicles Charging Station Operation (2021)	Financial University under the Government of the Russian Federation, Okinawa Institute of Science and Technology Graduate University, The University of Tokyo	Japan, Russia, Saudi Arabia	—

Independent citing papers only; self- and co-author citations excluded. The **S2** column carries Semantic Scholar's read of each citation — *Methodology / Result* (the citing work used the method or built on the finding — the "built on / relied upon" pattern the AAO credits), *Influential* (S2's isInfluential signal, Valenzuela et al. 2015), or *Background* (a passing mention).

Citing-text excerpts — how the field used this work

> **METHODOLOGY** Analysis of Battery Lifetime Extension in a Small-Scale Wind-Energy System Using Supercapacitors
>
> *"This technique has previously been successfully applied for use in battery lifetime modeling [46], [47], [50]."*

Contribution 3

Claim — Contribution 3

The researcher experimentally demonstrated frequency regulation by commercial buildings through modeling and hierarchical control design, establishing a foundational framework for building-grid integration.

CLAIM: The researcher's seminal 2016 work, titled 'Experimental demonstration of frequency regulation by commercial buildings—Part I: Modeling and hierarchical control design,' represents a key contribution to the field of smart grid technologies. This paper serves as the core reference for this line of inquiry, focusing on the practical implementation of control strategies within commercial infrastructure.

ORIGINALITY: The title suggests a novel approach to leveraging commercial buildings for grid stability, specifically through the development of hierarchical control designs. By emphasizing experimental demonstration, the work appears to bridge the gap between theoretical modeling and real-world application, addressing the challenge of integrating flexible building loads into frequency regulation markets.

SIGNIFICANCE: With 164 citations, this work has garnered substantial attention within the academic community. Notably, 100% of the classified citing papers originate from independent researchers, indicating that the methodology and findings have been widely adopted and validated by peers outside the researcher's immediate institution or collaboration network.

INDEPENDENT CITATIONS FOR THIS CONTRIBUTION: 9 **· 2 flagged influential by Semantic Scholar**

CORE PAPER

Experimental demonstration of frequency regulation by commercial buildings—Part I: Modeling and hierarchical control design

2016 · 164 citations (GS)

Field-normalised: 120 Semantic Scholar citations place it in the top 5% of Engineering papers from 2016 indexed by Semantic Scholar, by citation count.

No.	Citing paper	Citing institution(s)	Country	S2
1	A survey on physics informed reinforcement learning: Review and open problems (2025)	Queensland University of Technology, University of Colorado	Australia, United States	—
2	Physics informed neural networks for control oriented thermal modeling of buildings (2022)	Ghent university – imec	Belgium	—
3	Model predictive control for demand flexibility: Real-world operation of a commercial building with photovoltaic and battery systems (2022)	Lawrence Berkeley National Laboratory	United States	—
4	Optimal bidding strategy for an aggregator of prosumers in energy and secondary reserve markets (2019)	INESC TEC, Institute for Systems and Computer Engineering, Technology and Science (INESC TEC), University of Porto	Portugal	**Methodology**
5	Demand response for residential building heating: Effective Monte Carlo Tree Search control based on physics-informed neural networks (2024)	Ghent University	Belgium	**Methodology**
6	Development of efficient, flexible and affordable heat pumps for supporting heat and power decarbonisation in the UK and beyond: Review and perspectives (2022)	—	—	Background
7	Cooling management and control of buildings for unlocking demand flexibility: A comprehensive review on the objectives, objects and methods (2025)	The Hong Kong Polytechnic University	Hong Kong	—
8	Quantifying the potential of load flexibility for building HVAC system using model predictive control strategy (2024)	The Hong Kong University of Science and Technology	Hong Kong	—
9	Convolutional Neural Networks for Automatic State-Time Feature Extraction in Reinforcement Learning Applied to Residential Load Control (2016)	—	—	**Methodology**

Independent citing papers only; self- and co-author citations excluded. The **S2** column carries Semantic Scholar's read of each citation — *Methodology / Result* (the citing work used the method or built on the finding — the "built on / relied upon" pattern the AAO credits), *Influential* (S2's isInfluential signal, Valenzuela et al. 2015), or *Background* (a passing mention).

Citing-text excerpts — how the field used this work

METHODOLOGY Optimal bidding strategy for an aggregator of prosumers in energy and secondary reserve markets

"On the other hand, increasing the temperature range in 2 °C corresponds to change the preferences of the prosumers from [20,22] to [19,23]."

METHODOLOGY Demand response for residential building heating: Effective Monte Carlo Tree Search control based on physics-informed neural networks

"We considered the 2R2C model [24] shown in Fig."

METHODOLOGY Convolutional Neural Networks for Automatic State-Time Feature Extraction in Reinforcement Learning Applied to Residential Load Control

"In a model-based implementation all nonobservable states are determined using a Kalman filter [41]."

D. Citing-Institution Prestige & Geography

Top citing institutions

Institution	Country	World ranking	Citing papers
Tsinghua University	PR China	SCImago #8 · THE 12 · QS =17	3
University of the Sunshine Coast	Australia	SCImago #4847 · THE 501–600	2
Aalborg University	Denmark	SCImago #745 · THE 251–300 · QS =306	2
National Renewable Energy Laboratory	United States	SCImago #653	2
Cardiff University	United Kingdom	SCImago #664 · THE 201–250 · QS 181	1
Mälardalen University	Sweden	—	1
IBM Research	Japan	SCImago #113	1
Xi'an Jiaotong University	China	SCImago #58 · THE 201–250 · QS 305	1
The Hong Kong University of Science and Technology	Hong Kong	SCImago #483 · THE =58 · QS 44	1
Munich University of Applied Sciences	Germany	—	1
Cherry Tree Scientific Software	Canada	—	1
Montana Technological University	United States	—	1
New York Power Authority	United States	—	1
State Grid Shandong Electric Power Co., Ltd.	China	—	1
Ghent university – imec	Belgium	—	1

Geographic distribution of citing authors

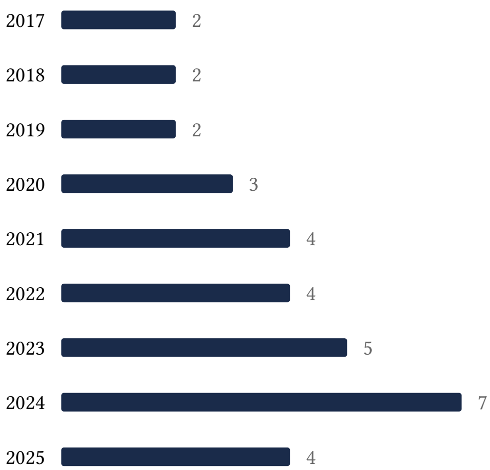
Country	Citing papers
United States	6
China	4
Australia	3
Belgium	3
Hong Kong	3
United Kingdom	3
Germany	2
Denmark	2

Country	Citing papers
India	1
Ireland	1
Italy	1
Japan	1

Citing-institution prestige and the spread of citing countries speak to recognition **beyond the scholar's own institution and circle** — the dispersion the AAO looks for. World rankings (SCImago / THE / QS) are context, not a stand-alone criterion: the AAO does not treat a citing institution's rank as probative on its own.

E. Citation Growth Over Time

Distinct citing papers by publication year. Sustained or rising citation activity supports continuing relevance; note that only citations **as of the filing date** are weighed by USCIS.



F. AAO Precedent Considerations

Pre-filing self-check (AAO denial patterns)

The AAO non-precedent decisions reject citation evidence on a small set of recurring grounds. Confirm the petition addresses each before filing:

- ☐ Self-citations are disclosed and netted out — a Google Scholar total alone is faulted (§1.1).
- ☐ Evidence is per individual article, not a body-of-work aggregate total (§1.2).
- ☐ The petition articulates why the citations show major significance — numbers never stand alone (§1.5).
- ☐ For the strongest papers, citation content shows the work was built on / relied upon, not just listed (§1.6, §2.2).
- ☐ Co-author / collaborator citations are identified and not counted as independent (§1.7).
- ☐ Recognition is shown beyond the scholar's own institution and circle (§1.8).
- ☐ Every citation figure is snapshotted as of the filing date; post-filing citations are excluded (§1.9).
- ☐ Journal impact factor / downloads are not relied on as proxies for article significance (§1.10, §1.12).
- ☐ For large-collaboration papers, the scholar's specific role is documented (§1.13).

- ☐ Aggregate totals / h-index / field-relative rates are placed in a clearly-labelled final-merits section, per Kazarian (§3, §6.1.7).

Disclaimer

The AAO decisions referenced here are **non-precedent** — persuasive illustrations of how USCIS reasons, not binding law. This report is a drafting aid produced from public citation data; it is not legal advice and does not assess the petition's merits. All analysis must be reviewed by qualified immigration counsel.

G. Citation Evidence Index

Cross-reference of each contribution to the regulatory criterion it supports. Counsel should map these to the petition's exhibit numbers.

Contribution	Core paper	Indep. cites	Supports
Contribution 1	Understanding small-signal stability of low-inertia systems	8	8 CFR 204.5(h)(3)(v) — Criterion 5
Contribution 2	Operating policy and optimal sizing of a high penetration RES-BESS system for small isolated grids	6	8 CFR 204.5(h)(3)(v) — Criterion 5
Contribution 3	Experimental demonstration of frequency regulation by commercial buildings—Part I: Modeling and hierarchical control design	9	8 CFR 204.5(h)(3)(v) — Criterion 5