# Article information:

Seismic performance of knee-braced frames equipped with NiTi BRBs - ScienceDirect  
<https://www.sciencedirect.com/science/article/pii/S0143974X22003522>

# Article summary:

1. This paper evaluates the seismic performance of knee braced frames (KBFs) equipped with steel or NiTi buckling-restrained braces (BRB).

2. Through cyclic loading tests on reduced-scale specimens, it was found that both KBs have stable cyclic properties under loading reversals.

3. The KBFs equipped with either steel or NiTi BRBs can meet the prescribed drift target, and the NiTi BRBs have higher seismic resilience due to their self-centering capability after strong earthquakes.

# 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:

This article provides a comprehensive evaluation of the seismic performance of knee braced frames (KBFs) equipped with steel or NiTi buckling-restrained braces (BRB). The authors conducted cyclic loading tests on reduced-scale specimens and used a performance-based plastic design (PBPD) method to design 3- and 6- story KBFs which were then subjected to a suite of earthquake records. The results showed that both KBs had stable cyclic properties under loading reversals, and that the KBFs equipped with either steel or NiTi BRBs could meet the prescribed drift target. Furthermore, it was found that the NiTi BRBs had higher seismic resilience due to their self-centering capability after strong earthquakes.

The article is generally reliable in its reporting as it provides detailed information about the experiments conducted and results obtained from them. However, there are some potential biases in the article which should be noted. Firstly, there is no discussion of any possible risks associated with using NiTi BRBs in KBFs, such as corrosion or fatigue failure over time due to repeated cycles of loading and unloading. Secondly, while the authors discuss how NiTi BRBs have higher seismic resilience than steel BRBs due to their self-centering capability after strong earthquakes, they do not explore any counterarguments which may exist for this claim. Finally, there is no mention of any other materials which could potentially be used in place of steel or NiTi for constructing KBFs; thus, readers are not presented with all sides equally when considering different options for constructing these structures.

# Topics for further research:

* Corrosion risks of NiTi buckling-restrained braces
* Fatigue failure of buckling-restrained braces
* Alternative materials for knee braced frames
* Seismic resilience of steel buckling-restrained braces
* Performance-based plastic design method
* Self-centering capability of NiTi buckling-restrained braces

# Report location:

<https://www.fullpicture.app/item/785880fbb07ea7740703ec2360ce4d07>