

## Approximate symmetries and conservation laws and their applications to PDEs

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Many nonlinear PDE models that arise in applications are in some sense “close” to integrable PDEs or other equations with rich analytical structure but lack such structure themselves. For PDE models with small parameter(s), one may be interested in finding symmetries, conserved quantities, and solutions that hold approximately [1,2], up to higher order terms in the small parameter(s). I will discuss approaches to the systematic construction of such approximate quantities and approximate solutions, their mathematical aspects, usefulness and relevance in the physical context [3], and examples of symbolic computer algebra-based computation [4] of these objects. This is a joint work with Mahmood Tarayrah and Zhengzheng Yang.

### Keywords

Nonlinear PDEs, Approximate symmetries, Approximate conservation laws, Symbolic computation

### References

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