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This manuscript was compiled on May 12, 2022

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Fig. 1. Placeholder image of a frog with a long example caption to show justification settina.

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$$= x^{3} + 3x^{2}y + 3xy^{3} + x^{3}.$$

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- Belkin M, Niyogi P (2002) Using manifold stucture for partially labeled classification. Advances in Neural Information Processing Systems, pp 929–936.
- 2. Bérard P, Besson G, Gallot S (1994) Embedding riemannian manifolds by their heat kernel. Geometric & Functional Analysis GAFA 4(4):373-398.
- 3. Coifman RR, et al. (2005) Geometric diffusions as a tool for harmonic analysis and structure definition of data: Diffusion maps. Proceedings of the National Academy of Sciences of the United States of America 102(21):7426-7431.