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Generalized Gaussian Bridges

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A generalized bridge is the law of a stochastic process that is conditioned on linear functionals of its path. We consider two types of representations of such bridges: orthogonal and canonical. In the canonical representation the filtrations and the linear spaces generated by the bridge process and the original process coincide. In the orthogonal representation the bridge is constructed from the entire path of the underlying process. The orthogonal representation is given for any continuous Gaussian process but the canonical representation is given only for so-called prediction-invertible Gaussian processes. Finally, we apply the canonical bridge representation to insider trading by interpreting the bridge from an initial enlargement of filtration point of view.

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