

## CANONICAL REPRESENTATION OF A GAUSSIAN RANDOM FIELD

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The purpose of this thesis is to obtain Gaussian random fields which are canonical and enjoy the conformal invariance property.

In the investigation of Gaussian random fields, one of the significant methods is to take a white noise and to have a representation of a given random field in terms of a linear functional of the white noise. In order to investigate such a representation, we should introduce a white noise with a  $d$ -dimensional ( $d > 1$ ) time parameter and to establish a class of its linear and non-linear functionals.

We are especially interested in the case of  $R^2$  and discuss a class of Gaussian random variables obtained by the integration with respect to a white noise over the domain  $B(a)$ , which is a disc having  $Oa$  as a diameter. Thus obtained random variables certainly form a Gaussian system. And this representation might be thought of a multi-dimensional version of canonical Gaussian processes and satisfies the conformal invariance property.

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