



A REMARK ON EXTREMAL FUNCTION FOR TRUDINGER-MOSER INEQUALITY WITH REMAINDER TERMS

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Abstract

Let Omega be a smooth bounded domain in R^2, h : Omega -> R be a function such that -Delta + h is coercive, where Delta is the Laplacian operator. We prove the existence of extremal function for the following Trudinger-Moser inequality

sup_{int_{Omega} (|nabla u|^2 + hu^2) dx <= 1} int_{Omega} e^{4pi u^2} dx < infinity.

Such kind of inequalities was originally proposed by Adimurthi-Druet [Adimurthi and O. Druet, Blow-up analysis in dimension 2 and a sharp form of Trudinger-Moser inequality, Comm. Partial Differential Equations 29(1-2) (2004), 295-322], generalized by Tintarev [C. Tintarev, Trudinger-Moser inequality with remainder terms, J. Funct. Anal. 266 (2014), 55-66] and Yang [Y. Yang, Extremal functions for Trudinger-Moser inequalities of Adimurthi-Druet type in dimension two, J. Differential Equations 258 (2015), 3161-3193]. This generalizes part of the known results. Our method is the usual blow-up analysis.

Keywords and phrases: Trudinger-Moser inequality, blow-up analysis, extremal function.

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