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Analytical solutions giving shape of laccoliths due to overpressure distribution expressed by Fourier series

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We derived analytical solutions giving shape of laccoliths due to overpressure distribution expressed by Fourier series. As Fourier series can describe all overpressure distribution including arbitrary discontinuity and/or asymmetry, the solution shown in here is a general solution that describes the shape of laccoliths. In this paper, we show laccoliths shape reflecting asymmetric overpressure distribution given by $p(x)=\exp[ax]$ (a = 0, 1, 2, 3), as numerical example. If the overpressure were expressed by even function, the shape of laccoliths is given by the Fourier cosine series. Under this condition, we obtained solution for inverse modeling estimating overpressure distribution from shape of laccoliths, by changing our solution form. As numerical test, we attempt to restore an assumed overpressure condition from the shape of laccoliths calculated under the condition of which the overpressure is constant and/or is given by $p(x)=\exp[3|x|]$. As a result, it was found that our solution gives overpressure distribution correctly from laccoliths shape.